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MOTOR BOATING

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EDITED BY CHARLES F. CHAPMAN

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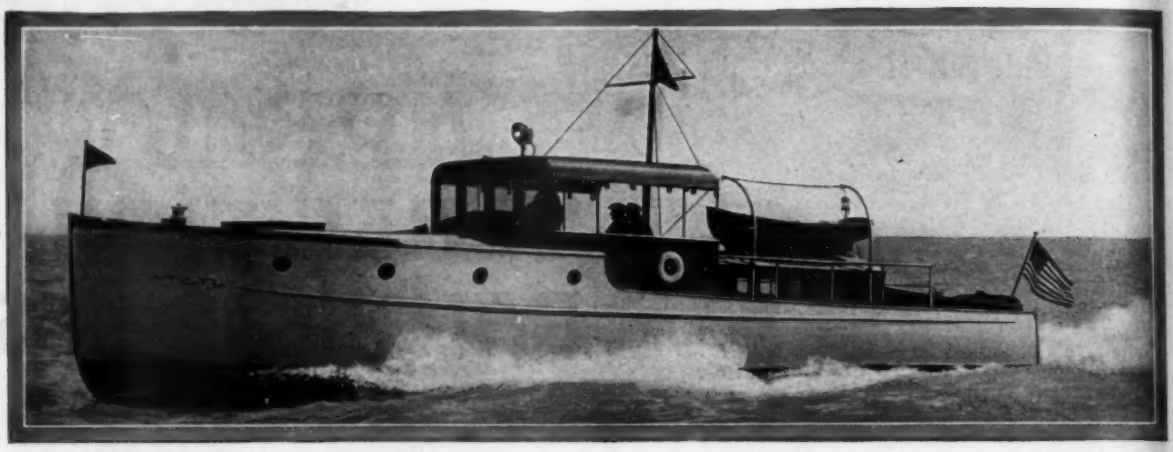
A New Express Cruiser



The 1919 Model of the Great Lakes Family Express Cruiser

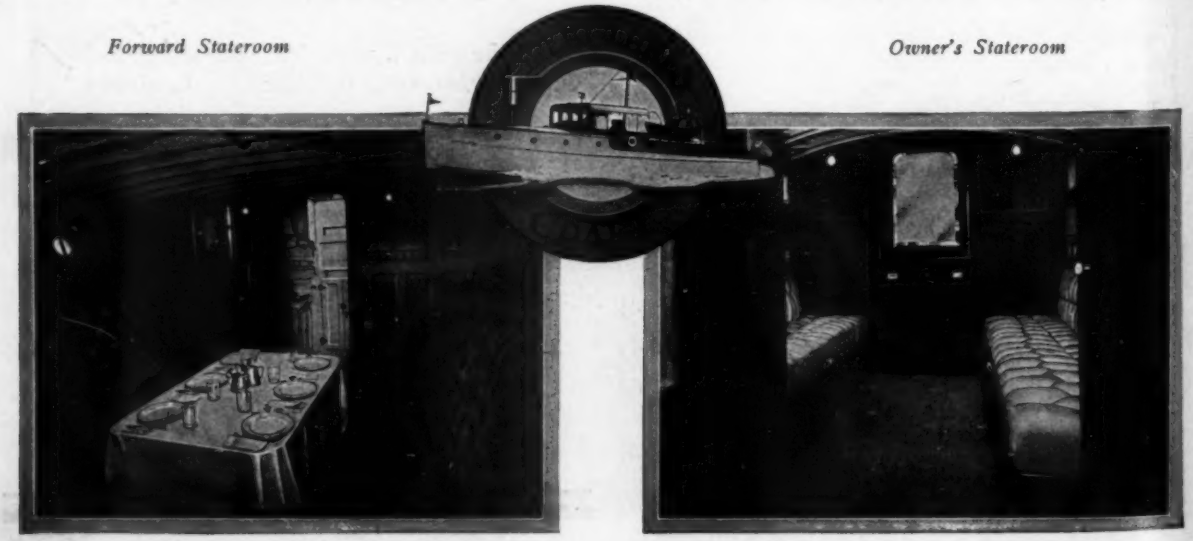
IT is a real pleasure to own a boat which is so far superior in appearance, equipment and performance as to be the cynosure of all eyes in the harbor. It is a source of gratification to own a boat which is so safe, seaworthy and fast that it can navigate any waters in any kind of weather. It is a distinct comfort to own a boat which is luxurious to the utmost degree in its every appointment. It gives a sense of pride of ownership to own a boat that permits of a range of speed from barely a perceptible movement through the water to twenty miles an hour.

The new Great Lakes Express Cruiser does all of this and more. A Fifty-two foot boat affording accommodations for a party of eight and a crew of two. Every comfort and luxury are made available. Such essentials of real comfort as running water, screens, real mahogany interiors, art glass panel doors, beveled plate glass mirrors, silk velour upholstery, velvet rugs, electric lights, etc., are integral parts of this remarkable boat.

Write or telegraph to-day for an illustrated brochure describing and illustrating this Fifty-two Foot, 20 mile Express Cruiser—it is interesting

GREAT LAKES BOAT BUILDING CORPORATION, Milwaukee, Wis.

Forward Stateroom *Owner's Stateroom*



Officers gathered around the "game board" at the Second Naval District where the battle and defensive formations of the motor boats were worked out

Yachtsmen Who First Suggested and Perfected the U. S. N. R. F.

How the Ideas for a Naval Reserve Force of Yachtsmen and Motor Boats Originated in the Minds of Motor Boatmen—The Fundamental Principles Which Were Worked Out in Peace Times and Proved Practical in the War

IT is a matter of recorded fact that the Second Naval District was the first district to recognize and use the patriotic enthusiasm which later swept the country in the form of the Naval Reserve Force. This was due chiefly to the foresight and imagination of Admiral Austin M. Knight, who, previous to the outbreak of the war, was the Commandant of the District.

To him had been brought early in 1916 the plan of a nation-wide patrol squadron, formed of patriotic yachtsmen willing to equip and train themselves to be of immediate auxiliary use in time of emergency. The Power Squadron idea also, although founded on somewhat different basic principles, was useful. He saw the value of these schemes, aided them to the limit of his power, and finally enrolled in the Second District, that first patrol squadron which was to be the nucleus of the great flotilla of power craft which served Uncle Sam so well in his hour of need. This will always be remembered gratefully by the motor boatmen of America for his help came at a time when material aid was needed to keep the plan afloat.

Lieut. Commander Stuart Davis was the man who conceived the details of the scheme in the first place. As long ago as 1910 he began to talk and urge it wherever there were listeners. In 1915 together with A. Loring Swasey and some others, the Patrol Squadron

Lieutenant Orson D. Munn, one of those yachtsmen who conceived the idea of a Naval Reserve and first put it into practice

came into being. For it Loring Swasey designed a boat which combined the maximum of efficiency with the minimum of expense. Then nine boats were completed from his designs and so impressive was their performance in the cruises made under naval supervision, that Admiral Knight felt justified in enrolling the squadron and its personnel in the District. It must be remembered that this was before the act of Congress created the Reserve Force as we know it. It is not at all unlikely, in view of the fact that the officers of the Squadron were in close touch with Franklin D. Roosevelt during their formative period, that their scheme had much to do with the Assistant Secretary's plan for the creation of a Reserve Force.

The roster of the Squadron carries the names of many of the men who afterwards became the group that organized and in large measure, perfected the Reserve activities in the District. When the war began the Squadron enrolled in the Reserve practically as a body, thereby bringing to the service a group of men who had actual water experience. Also, for the most part, they were men who had been established in their civil pursuits and were trained executives and organizers. To them is due the credit for building a highly efficient machine out of nothing; doing it in record time.

Motor warships in Squadron formation on Buzzards Bay

The conditions which existed at the beginning of the war proved that the activities of the Squadron as they had been planned, must give way to the more prosaic job of coast and harbor patrol and regulation of shipping. In order to do this intelligently the district was divided into sections, each under its own commander.

Stuart Davis, in view of his organizing work in the patrol Squadron, was commissioned Lieutenant-Commander and throughout the war, remained the ranking Reserve officer in the District. His first work was to form the Inspection Section and the Joint-Shipping Board, the duty of the latter being the passing on for fitness and appraisal of the boats to be taken over by the Government in the District. When these were well established he was made Aid for Information to the Commandant which highly important post he held brilliantly until the cessation of hostilities.

As his assistant was Lieut. (j g) T. Philip Hartt, well known to New York yachtsmen. Later Lieut. Hartt became Senior Aid to the Commandant. Ensign Griswald Lorillard, who had been Commander Davis' personal aid since his enrolment, then acted as assistant until demobilization.

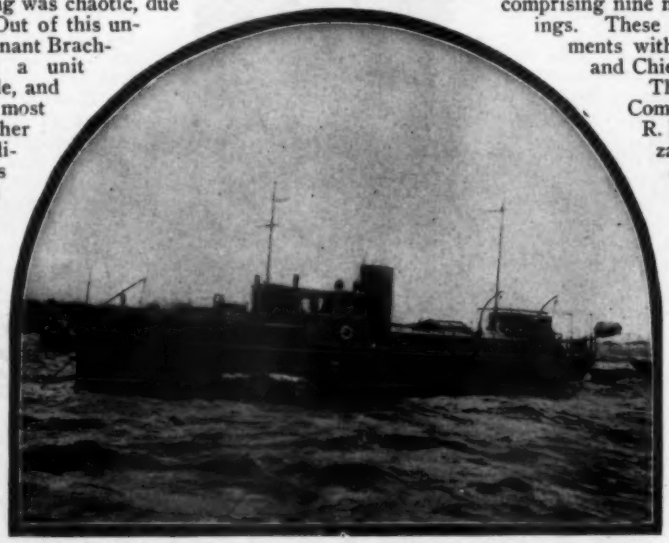
Newport itself, naturally was the most important base and its patrol section the largest. From it the other sections took their example and their standards of efficiency. Lieut. (j g) T. K. Brachvogel, who left a large New York law practice, was the commanding officer. He was assigned to this duty when patrolling was chaotic, due to lack of organization. Out of this unpromising situation, Lieutenant Brachvogel's enthusiasm built a unit which patrolled on schedule, and kept the seas under the most adverse conditions of weather and ice. Also under his direction a weekly paper was started and published which had much to do with the cohesion and morale of the Reserve Force in the District. Lieut. Brachvogel gives much credit to his executive officer, Lieut. (j g) Robert M. McCorkle for the successful working out of his plans.

Another man drafted from the Patrol Squadron whose work has left its imprint on the District, was Lieut. Orson D. Munn, the noted patent attorney and one of the publishers of the *Scientific American*. To him fell the job of Enrolling Officer, and he is responsible more than any one other man for the high grade personnel of the District. His speaking trips to the various universities accounted for the large percentage of college men that came to the District. Approximately 13,000 men passed through his offices into the Reserve Force and so excellent was this material that more than ten per cent. of them received commissions before the signing of the Armistice. In addition to this primary duty, Lieut. Munn acted as legal advisor to the enlisted personnel, had charge of the athletic activities, and the naturalization of aliens in the Service.

One of the reserve activities of which the District was justly proud was the Material Section under the command of Lieutenant Louis S. Treadwell. With the inception of the patrol fleet it was necessary to provide an organization to repair and keep the boats up to their maximum efficiency. Also, when Uncle Sam took over the boats that were to form his coast patrol, they were so diverse in type and equipment, that a certain standardization was imperative. The working out of this, and the furnishing of armament was left entirely to the Material Section. It is said that the first day he was assigned to duty, Lieut. Treadwell bought a monkey wrench and made the first repairs himself. In fact, he was the whole Section. In a few short months the Section had grown so that it covered 49,000 square feet comprising nine main and four small buildings. These housed eighteen departments with a personnel of 150 men and Chief Petty Officers.

The Medical Aid to the Commandant was Commander R. E. Ledbetter. The organization of the Reserve Medical Corps under his direction was largely responsible for the excellent general health of the personnel.

Lieut. Fred B. Thurber, whose pilotage of the 19-foot yawl Sea Bird across the Atlantic is known to all yachtsmen, was in command of the Mine Force. The daring and resource that brought about the successful termination of that trans-Atlantic voyage found a new field in the work of mine sweepers. Not only did the con-



Daroga, which was taken over by the Navy Department as mother ship of the Patrol Squadron

At the right: Hon. Franklin D. Roosevelt, Assistant Secretary of the Navy, known as the Navy's "Main Spring." It was Mr. Roosevelt who put the many ideas about a Reserve into workable shape

Lieut. J. G. Brachvogel

everythng except its walls, was leased. Then Lieut. Washburn turned his force loose on it. Out of the personnel came every sort of mechanic and artisan and without a cent of Uncle Sam's money spent on outside labor and without taking an hour from regular patrol, the old plant was transformed into a cheerful, comfortable community with every facility for work and play. Even a dock builder was found among the men and an excellent boat basin reclaimed from what was a crumbling stone pier. Lieut. Washburn's organizing and executive ability is proven by the monument he left behind when civil life again claimed him. Not only the selected personnel had this schooling, for Lieut. Washburn constructed a war game board and each officer proposed a tactical problem which was worked out by the whole staff.

The motor boatmen of the Great Lakes will find their representative in Lieut. Thomas T. Prindiville who was the Commander of the Nantucket Section. Block Island, that Heligoland of our North Atlantic Coast, housed a Section whose destinies were directed by Lieut. Merriman. The fact that the Lieutenant has only one arm proves nothing to the men of his command for they will contend to the extent of bloody noses, if need be, that there isn't a better two-handed sailorman in the Navy and that, anyhow, Nelson only had one arm when he won the battle of Trafalgar.

The Section at New London was started by Lieut. (j g) Harold Vanderbilt who was succeeded by Lieut. Frank Burns, a man well known to the Naval Militia. Lieut. (j g) Brinkerhoff made the Woods Hole base into one of the most

(*Continued on page* 64)

verted porgy boats do their duty of keeping the shipping lines clear of the horned jelly fish that have brought death to so many proud ships, but they acted as coast guard cutters in the absence of the latter on the more serious business of war. Many a salvage and rescue job undertaken in the teeth of gale and ice, is written on the records of the Force, and these errands of mercy were usually under the cool headed direction of the Commander.

The patrol of Buzzards Bay and the control of east bound shipping through the Cape Cod Canal fell to the lot of the New Bedford Section. Loring Washburn, Lieut. (j g) was made commander, and immediately instituted patrols with the three boats that formed the nucleus of his fleet. This section had from the start the highest possible record of efficiency for the primary task of patrol. But possibly its greatest achievement was the fact that the section built for itself by itself the most up-to-date self-contained base in the District. A manufacturing plant that had been unused for ten years and stripped of

Sub chaser 277 built at the Mare Island Navy Yard, Cal. This boat has not a butt in her construction but full 110-foot lengths of stringers and planks

American Chasers and Yachts Sink More Subs Than Rest of American Navy

Experiences Aboard Noma During a U-Boat Attack

By Ensign H. Lovell Carr, U. S. N. R. F.

A FEW days after the signing of the armistice the British Admiralty announced that it had officially given credit to the American men-of-war ten German submarines, and in doing so announced the names or numbers of those ships that had been so successful. In that list there was included the names of Kanawha, Wakiva, and Noma, and the names of their commanding officers.

These were converted yachts and their names in pre-war days were always linked with Bar Harbor, Newport, or Palm Beach.

The following will tell briefly to those on this side why and how their names are included in such an illustrious group. Also how a few members of the "Suicide Fleet" behaved when the opportunity presented itself, even though it was rumored that in the sporting fraternity the odds were against their even reaching France.

In the middle of November, 1917, Kanawha, Wakiva, and Noma had sailed from Brest to a certain rendezvous in order to meet an incoming convoy bringing supplies from the States. After meeting the convoy, which kept its course and position, the three yachts took their designated positions and commenced their irregular zig-zaggings. Nothing occurred on the way to St. Nazaire, where the convoy was bound, except the receiving of a couple of Allo's by the radio operators, denoting that a submarine was not far off.

Upon the arrival at St. Nazaire the supply ships immediately went through the locks and moored to the quai, where their holds were at once attacked by a small army of Boche prisoners, working under the direction of the U.S.A. Quartermaster Corps.

The yachts let go their anchors in the swift and very muddy Soire River. This was followed by preparing the decks for coaling ship, which was to take place early the next morning.

U. S. NAVY SANK 10 U-BOATS IN WAR

36 OTHERS DAMAGED—500 BATTLES FOUGHT

London—American naval forces engaged in 500 battles with submarines, it was announced today. Ten U-boats were sunk by them and thirty-six others damaged.

Participating in the sinkings were the destroyers Fanning, Nicholson, and Tucker; the armed yachts Lydonia, Wakiva, Kanawha II, Noma, and Christobel; the submarine chasers Nos. 215, 129, 128, 95, 179, and 338.

The above dispatch mildly emphasizes the importance of the American yachts and motor boats in the naval war just ended. Only three destroyers are credited with U-boat sinkings, the only strictly naval vessels to win against them, yet five yachts and six motor boat chasers have sinkings to their credit. Thus it will be realized that our motor boats and yachts did more to rid the seas of the enemy subs than the rest of the American Navy combined.

The following day the crews shovelled and passed coal in a drizzling rain and the monotony was only broken by plenty of hot Java and a few woud-be witty gobs who were continually making remarks about "this being my last war" and about living in a cave in the mountains when they got out. However, after finishing up and washing down, half of the crew went ashore on liberty, where from all appearances some of the boys engaged in "beaucoup vin rouge." Upon return they forgot their hard luck stories and agreed that the life was not so bad after all.

The next day the S. O. P. (Senior Officer Present) received orders to take a couple of "empties" back through the danger zone. All the yachts began preparations, both on deck and in the engine-room, to get under way.

Three times during the day radio broadcasts were received that an enemy submarine had been sighted. First off Penmarch Light, next off L'Orient, and last near Belle Isle, in the entrance of the Soire to the sea. Also word came that on the previous night an American vessel had been sunk, thus removing any doubt that the radio messages might have been false alarms by the lookouts who reported them. Lookouts very often get in the

Two white gobs in the Naval Reserve after coaling a converted yacht in foreign waters

Noma and Wakiva moored at Brest

habit of "seeing things" that nobody else could possibly see.

Experience had taught those who had been on the "Breton Patrol" that the Germans had a regular station from Penmarch Light to Belle Isle. In that vicinity a submarine was always lurking. If the Allies were fortunate enough to get "Penmarch Pete," as he was called, another "Pete" showed up and did his best to make up for lost time.

About five o'clock in the afternoon the three converted yachts got under way. Two supply ships came out of the quai and steamed slowly toward the sea. Over them hovered a couple of French seaplanes, which remained with the convoy till dark. They were always ready to drop their own bombs on any suspicious object in the water that they should happen to see.

Life on the ocean wave aboard Noma

There seemed to be a nervous feeling that there might be something doing during the course of the night. Although the lookouts and gun crews were especially warned, no extra men were stationed.

The convoy headed for the sun that was setting like a ball of fire. A little later, about 6:30 P.M., the moon shone brightly on a very heavy ground swell, which has made the Bay of Biscay—or, as the French call it, the Gulf of Gascony—famous throughout the seafaring world.

The convoy was now steaming with all ships in position. Kanawha in the van, Noma off the starboard quarter and Wakiva off the port quarter. The two supply ships were in the center of the triangle.

Suddenly the red rocket of a Very pistol came flaming through the air from the bridge of the Kanawka and in the deep darkness she could be seen to circle and close in toward the larger of the two convoyed ships, so as to afford more protection.

Noma swung to the direction of the signal, as did Wakiva. Both were going in circles. The 3-inch gun of Wakiva cracked out three times, and from the tracers on the projectiles the direction of their target was picked up by Noma. Noma circled to the place where Wakiva's shells had fallen. At that place one of the lookouts cried out, "There it is, about 2 feet under the surface." Eight depth charges were released and exploded from the stern, while Wakiva followed and let two more go.

Wakiva signalled in a few minutes to Noma: "Think you got one; we passed through wreckage."

No further time was taken to look for possible submarines and both ships headed full steam to come up with Kanawha and the ships in her charge. In an hour or so the five ships had resumed the original positions and no further incidents occurred until the farewell signal was hoisted.

Upon the return to Brest, the big rumor of the many that were flying thick and fast about the harbor was that a disabled German submarine had beached itself on the shores of Belle Isle. This rumor was never confirmed. In a couple of weeks the incident was almost forgotten in the press of present duties.

At this time the crews of the respective ships were called to quarters by their captains and a letter was read from Admiral Sims, in which he congratulated the ships, officers and crews on their behavior during the short engagement. The ending of his letter ran as follows: "You prevented the destruction of one or more ships and unquestionably seriously damaged an enemy submarine."

This satisfied all concerned on those ships, for it was known that our senior sea fighter would not write such a letter unless he had very good reasons for doing so.

Incidents of this sort or encounters in which American yachts and motor boats fought "Stand Up" battles with submarines that came up to the surface were not infrequent throughout the American participation in the war. Manned largely by Naval Reservists and National Naval Volunteers these craft carried crews who took a keen sporting interest in their work and were always happy when a periscope was sighted. That meant relief from the deadly monotony of patrol and convoy duty; it meant action and that was what they had enlisted for, action—plenty of it.

Many of these small craft were armed with guns much smaller in calibre than those carried by the underseas craft. Some of the yachts and chasers had but one gun, whereas even the smaller German U-Boats carried one forward and a second aft, while others carried a third anti-aircraft gun amidships that could be used on surface enemies if necessary. But the little American warships were always ready to give battle and it was the exception rather than the rule when the German boats would fight—it was safer to submerge.

A close-up of Kanawha although nearly invisible on account of her camouflage

The Service of Thrills

American-Built, British-Manned, 80-Foot Motor Launches Fought the U-Boats From Suez to the Arctic Ocean—"Movies," Their Crews Called Them—And They Were

By Harwood Koppel

Photograph by Underwood & Underwood

"The MN—stop instantly" signal was a frequent one on the motor launches as they brought some mammoth steamer too until her papers could be examined

SHOULD I seek an appropriate appellation for the work done in the Great War by the 80-Foot Submarine Chasers I would call it the "Service of Thrills," for in no other branch of the service, afloat or ashore, could one find more thrills to the minute—about sixty of them I should say—than in this service. Day and night, these little boats ploughed over or under the waves, seeking, ever seeking the deadly U-boat, convoying huge merchant ships, much like the small dog that goes skirmishing around an elephant; scouring the dancing waters for crippled airplanes, hunting for mines and scouting on the outskirts of some fleet of Allied warships. One day it might have been scouting with a small squadron of slow-moving American gunboats based at Gibraltar returning from a convoy trip, and again it might have been the majestic Grand Fleet of the British Navy itself, as it contemptuously steamed over the rough, tumbling, icy waters of the North Sea, daring the German High Sea Fleet to come forth from behind the shelter of mine barriers and coast fortifications.

If the British Navy was to undertake an adventure against the Belgian coast; if Ostend or even Zeebrugge was to be attacked, the 80-Foot Motor Launches were sure to be assigned an important part in the operation. No service was too dangerous for them to undertake. No sea was too rough for them to be ordered out; no gale was too strong for them to brave. If ever American boatbuilding was put to the test it was in the service in which these little craft was engaged and their builders, the Elco Wks of Bayonne, N. J., not only tiny motor boats that stood the constant buffeting of unfriendly seas, but turned out 550 of them in 488 days, or more than one a day. Truly, this was one of the great American enterprises of the war, and the service rendered by these American-designed and American-built boats deserves an illuminated page in the history of the war.

The feat of their construction has already been told in previous issues of MoToR BoatinG, and in this article I desire to confine myself exclusively to some phases of the service they rendered in the war. All of their deeds would require volumes to tell, but a brief review is possible. The Elco people have prepared a brochure which they intend distributing to those interested in the near future, telling something of their deeds of valor in the war. From that brochure I have secured some of the data used herewith. The rest I picked up at first hand, when, in the early part of America's participation in the war, I was stationed on the United States fleet based at Gibraltar, where some thirty or forty of these American-built Submarine Chasing Motor Boats, or Motor Launches, as the British called them, were on duty.

The little 80-footers were only armed with one gun but they carried a large supply of the deadly depth bombs—and used them frequently

It was there that I first learned of their worth. They were always a source of interest to the officers and men in the little American squadron, for they were a virile advertisement of American ingenuity and enterprise, and as they went put, put, putting around the inner harbor inside of the moles or out into the Bay of Gibraltar, bordered on three sides by the huge towering rocky fortress, generally believed to be the strongest in the world, and the craggy mountains of Spain, they reminded one much of some busy American yachting harbor of ante bellum days. Their blue coated, white trousered officers with their broad British naval caps appeared much like pre-war American yachtsmen as they stood a-straddle the bouncing decks with their feet braced to starboard and to port, and for all that they carried the naval ensign of the Mistress of the Seas, they bespoke America even more than did the gunboats at anchor from which the Stars and Stripes floated snappily in the breeze.

But it was when a convoy was being formed out in the Straits of Gibraltar preparatory to making its way into the Atlantic or the Mediterranean that they were busiest, for then it was that they chugged about from ship to ship, their commanders leaning out of the shelter of their bridges, megaphone in hand, calling out clear, incisive orders to the merchant skippers or semaphoring to the commander of some Allied warship signifying that they had heard and understood their own orders. In the late afternoons when the convoy weighed anchor and moved slowly through the Straits on its way seaward the motor launches were scouting ahead, on the flanks and away back behind, ever on the alert to pick up some venturesome periscope. It was a comparatively easy matter for a U-Boat to lay under the surface of the narrow Straits and await the sure approach of a convoy, which, hemmed in on either side by the Spanish and Moroccan coasts, would have no chance to scatter and escape, and it was here that the work of the American-built motor boats was invaluable.

When the larger ships had reached open water and stood out to sea, the little fellows would turn, their task accomplished, and make their way back, ready on the next day to perform the same service all over again with another convoy, and so it went, through interminable days, all the while the Boche underseas commanders cursed in impotent fury the craft that had come 5,000 miles or more across the great ocean to make his work a hazard of life and death.

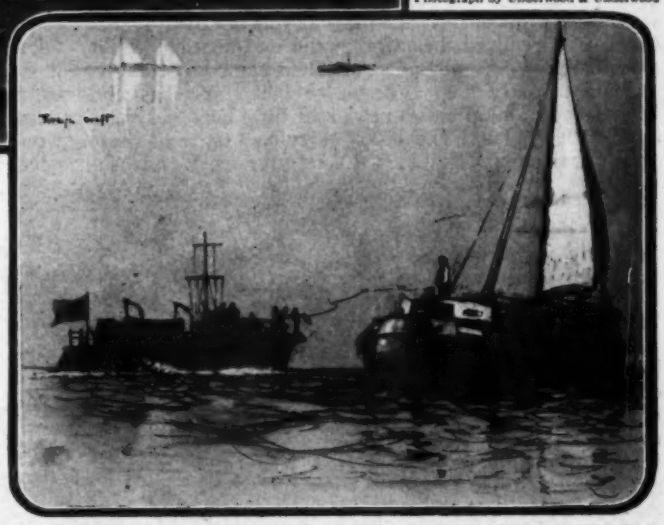
While this was going on at the gateway to the Mediterranean, the same thing was being done in scattered sections of the universe. At Malta, where the Japanese Mediterranean fleet was based; at Salonika; off the Dardanelles; at the entrances to the Suez Canal; in the Aegean Sea; in the Red Sea and along the Italian and French coasts they were to be found. In and out of the numerous harbors of the British Isles they were scurrying, and up in the cold, gray reaches of the North Sea they were doing yeoman service.

In the beginning of their careers one of the British Admirals in command at one of the bases was skeptical about the ability of the little boats to stand up in a Channel storm. In order to convince him, a representative of the Elco company, along with a picked crew took him out, and as the craft slid from the dizzy height of a giant wave into the vast depths of a trough they gave him a practical demonstration of the seaworthiness of the Eighty-Footer that left him for ever after a staunch advocate of more, and yet more of the little vessels.

The North Sea patrol was a man size job. Biting cold, bleak gray, dreary days when it was impossible to prepare hot food and drink

Up in the gray reaches of the North Sea. Up there in Scapa Flow and beyond Pentland Firth in the Firth of Forth where the Grand Fleet had its two bases, there these little warships were as busy as the proverbial humming bees. But they were not only humming as they went on their way, they were stinging as well, and in the records of the British Admiralty one may see to-day entries that tell the tale of submersibles that made involuntary submergencies, with

Photograph by Underwood & Underwood



During the blockade all suspicious craft were boarded and searched. One of the greatest difficulties was keeping open the sea to neutral shipping without letting through German "masters of craft" which were bent on scattering mines

blanched frightened faces never to come to the surface again.

It was part of the duty of the "Little Fellows" to hold up and board the tramp steamers and other merchantmen plying near Allied ports. This was precarious work, for oftimes the skipper of the liner when accosted suddenly from the surface of the sea in the black of a wintry night or the haze of an early dawn would ring his alarm bell in the belief that he had an underseas craft to deal with, and as the gunners would come flying to their pieces, each gun crew eager to get in the first shot at the supposed enemy, it

(*Continued on page* 57)

Jingo

A Little 12-Foot Bangabout You Will Enjoy Building

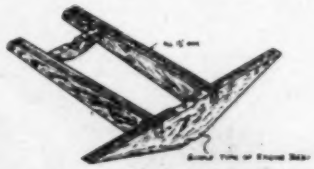
By C. E. Bradley

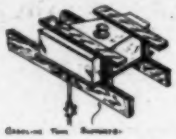
A little 12-footer that was specially designed for week-end fishing trips on a good size lake

This little boat can comfortably carry a party of four persons and has a fair turn of speed

JUST about a year ago at this time, all slicked up and resting quietly in its crate was a nifty little 2½ h.p. Lockwood-Ash motor which a Motor Boating prize article had previously helped me obtain. Knowing how eager the little putter would be to commence its chug-chug with the advance of spring days, I began to feel as if it was time to get busy and build another little boat if its young hopes were to be realized. While the war was not over at that time, yet I realized that after it did end boating would come back stronger than ever so I laid plans accordingly.

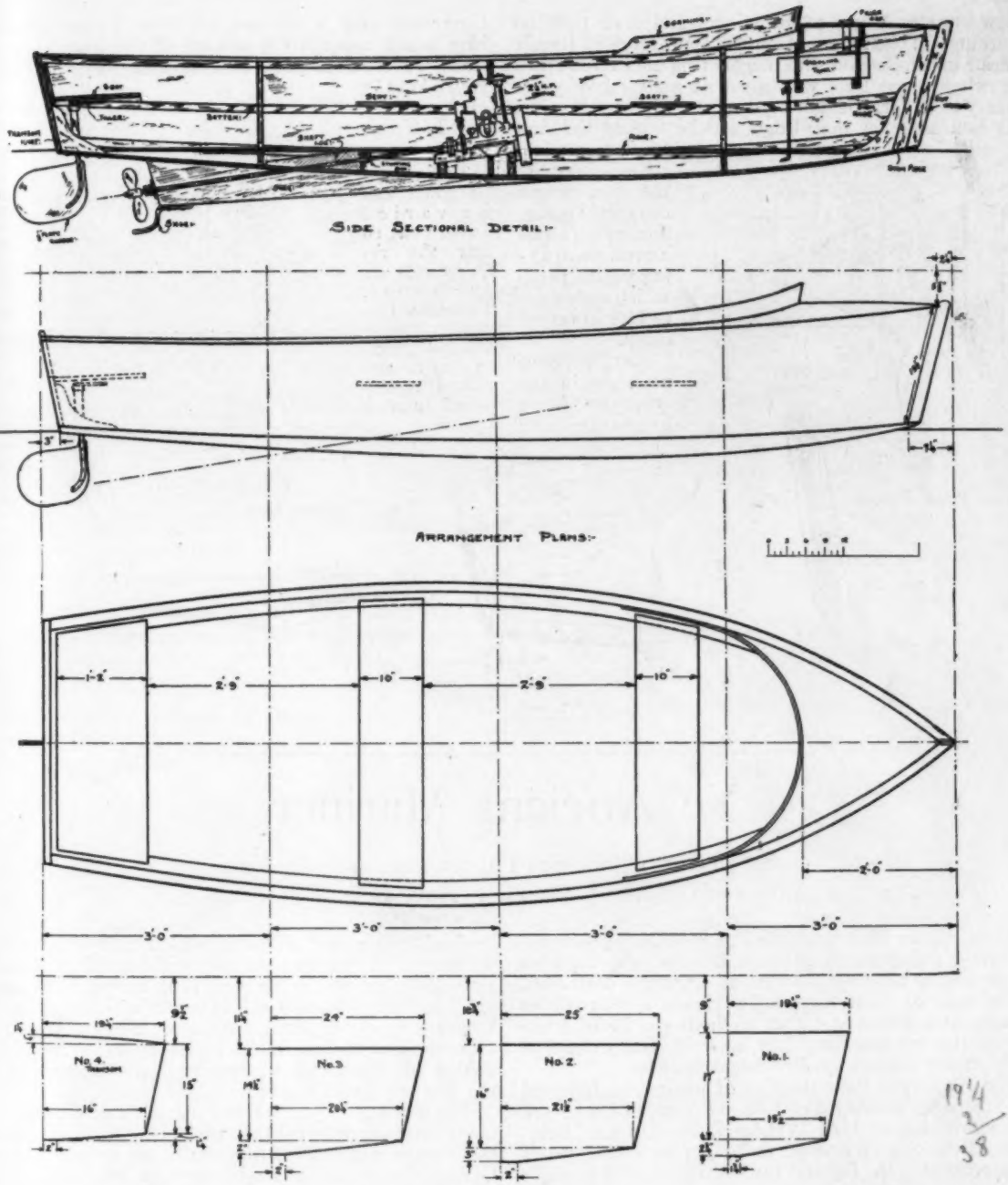
As a primary step I began to make sketches and what I had in mind was a neat, stiff little boat, easy and inexpensive to build, capable of carrying a party of three or four people and to be used solely for week-end fishing trips on a good sized open lake. It was a howling cold Saturday night when the final lines were sketched out on paper but with the appearance of those promised nice warm days Jingo was complete in every detail and ready to take on gas and oil. After a successful launching and a summer of continuous use in all kinds of weather on fishing trips lasting from daylight until dark (and well nigh midnight on one or two occasions) I had ample opportunity to test the little outfit thoroughly and it was certainly with reluctance that I gave up to November's chilling winds and hauled her out.





For the man who already owns a summer cottage at the beach or the chap lucky enough to possess a camp beside the shore of an inland lake a little boat of the Jingo type is just the craft. Whether it be a clamming trip to a certain distant point way up the beach, a fishing excursion for bass or perch way down in the favorite cove, or a berrying party to the hillside just up the shore, to Jingo it's all the same, it will take you safely there, then bring you back. Then, too, it is just the kind of craft a couple of kids delight in tinkering about and keeping shipshape.

In order to build you need only a few ordinary wood working tools and a cellar or shed, preferably with a good level floor. Elaborate detailed instructions for building are hardly necessary as the drawings have all been made so as to clearly tell the story and are quite complete and the actual work is simplicity itself. There are, however, perhaps one or two points worthy of emphasis. First in my mind is the necessity of assembling all the parts of the framework evenly, true and level to the dimensions called for on the drawings. Upon this part of the work depends the general shapely appearance of the boat. Secondly, see to it that all joints are made fair and as neat in fit as you can possibly get them.



Section, outboard profile, deck plan and half sections. Scale ½ inch equals 1 foot

And last of all, when you come to put on the finishing touches slight nothing, but put into each little job just the best work you can and the entire outward appearance will certainly repay for the little extra time spent.

The side sectional detail shows the boat fitted with a skeg and shoe. This arrangement is to be desired if you are to sail in places which are rocky or abound in sunken stumps, etc. If, however, your sailing will be for the most part in rock free water the skeg arrangement can be dispensed with and an inboard shaftlog together with a simple outboard strut employed.

The arrangement above the waterline, including the decks, coaming, etc., can be altered to suit the fancy of the builder. When finishing up my own craft I added a narrow covering board with a low coaming clear around the cockpit with a lazy back at the stern seat. All because I just happened to have the stock on hand that would nicely do the job.

The accompanying picture of Jingo in the back yard just before launching shows the neat little khaki duck sprayhood which can be folded on the forward deck or raised in a jiffy should occasion arise. This additional feature cost a few cents under $1.50 for the remnant piece of duck, grommets, etc. (The mate took her pay for the stitching, etc., in sailing later.)

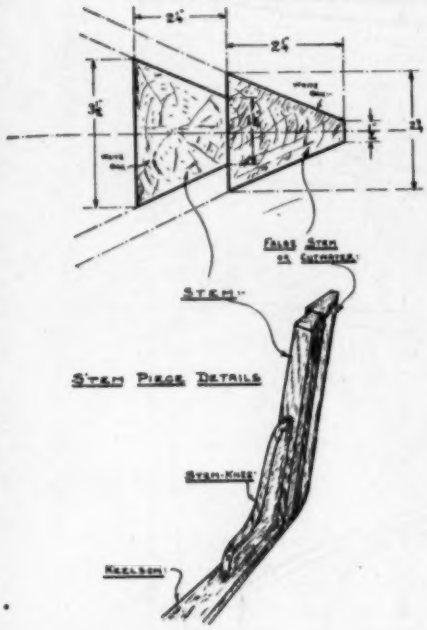
The pictures of Jingo afloat at her mooring show the heavy canvas cockpit cover with which she was fitted. This also was a most desirable addition, requiring but

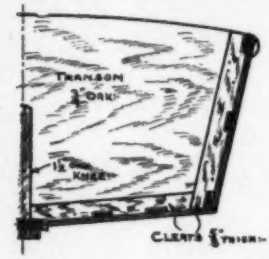
a few minutes longer to throw over and draw tight on returning. This, judging from the appearance of Jingo's interior in comparison with neighboring uncovered craft, I concluded was time well spent no matter how great a hurry to be off, whether starting the trip or returning.

It is a safe bet that Jingo will be among the first boats to get into commission with the first warm days of spring huntng up those accommodating yellow perch which early start to bite so ravenously.

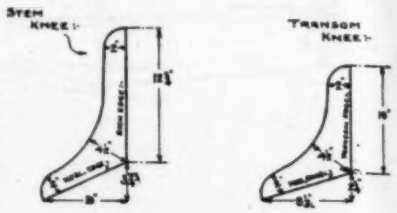
Get started now, go in for one, you won't begrudge the Government tax in the least, and don't forget the magazine would appreciate a picture of the boat when finished. Here's to your success and may you enjoy your little craft as much as I have mine.

The amount of power can be varied somewhat to suit the requirements of the owner. In the last December issue of MoToR BoatING there appeared a list of all suitable motors.

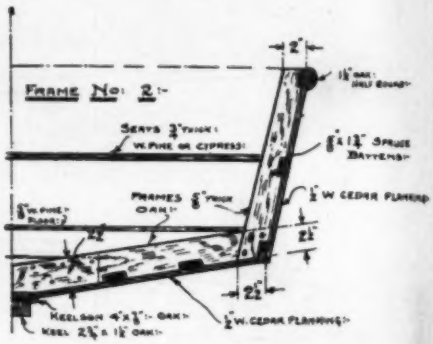




TRANSOM DETAIL



TEMPLATES FOR LAYING OUT STEM & TRANSOM KNEES



DETAIL OF CONSTRUCTION

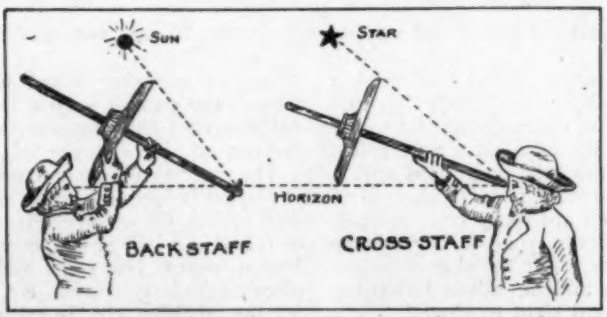
Ye Ancient Mariner

Some of the Difficulties Encountered by the Navigators of Old and How They Have Been Overcome

IN the series of articles on Practical Navigation recently published in MoToR BoatinG the methods of finding a ship's position at sea were dealt with in the light of modern methods. From a comparative view point a glance at earlier methods will be of interest to the student launched upon a comprehensive study of the subject by Mr. Angas' articles.

The English in their theories of navigation followed the Spaniards as they had followed that nation to the new world, but in 1573 William Bourne in his "Regiment of the Sea" put dead reckoning on a safer basis by popularizing the log and Bunderville in 1789 brought into general use the cross staff for taking meridian altitudes which was considered a great improvement over the astrolabe.

Another Englishman, John Davis, of Arctic fame, improved upon the cross staff by changing the line of sight which in conjunction with Flamsteed's experiments in reflecting a ray of light gave Halley the incentive to produce the quadrant, the forerunner of the sextant, in 1731.



In taking altitude observations the Eighteenth Century navigators used the cross-staff, which was later superceded by the back-staff. Either of these are clumsy when compared to the present day sextant

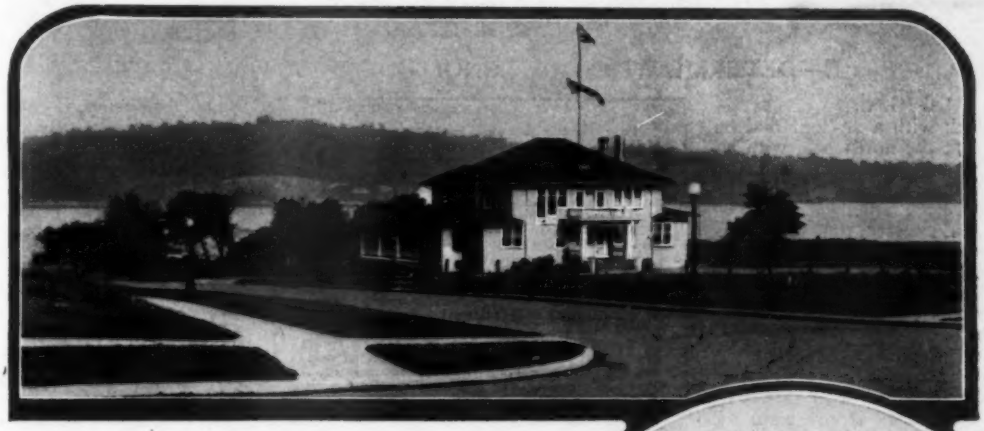
Finding the longitude was still a complex problem with uncertain results, the modern method of using a time piece for computation in 1761 followed six years later by the first nautical almanac which was based upon the theory of lunar distances. The errors arising from the use of these tables primarily led to the establishing of Greenwich observatory with Flamsteed as the first astronomer royal.

The plotting of courses and distances was subject to many errors due to the lack of knowledge to represent the curved surface of the earth on a plane chart. Globes were made to d othe work as best they could. In 1859 Gerard Mercator of Flanders hit upon the principle of projecting the curved surface of the earth on a plane surface, but the idea was not clear in his mind and it remained for Edward Wright, an English scientist, to give the mathematical solution upon which our present Mercator projection charts are made.

Bit by bit the science of navigation has been elaborated and yet simplified.

A Canadian Club with a Real War Record

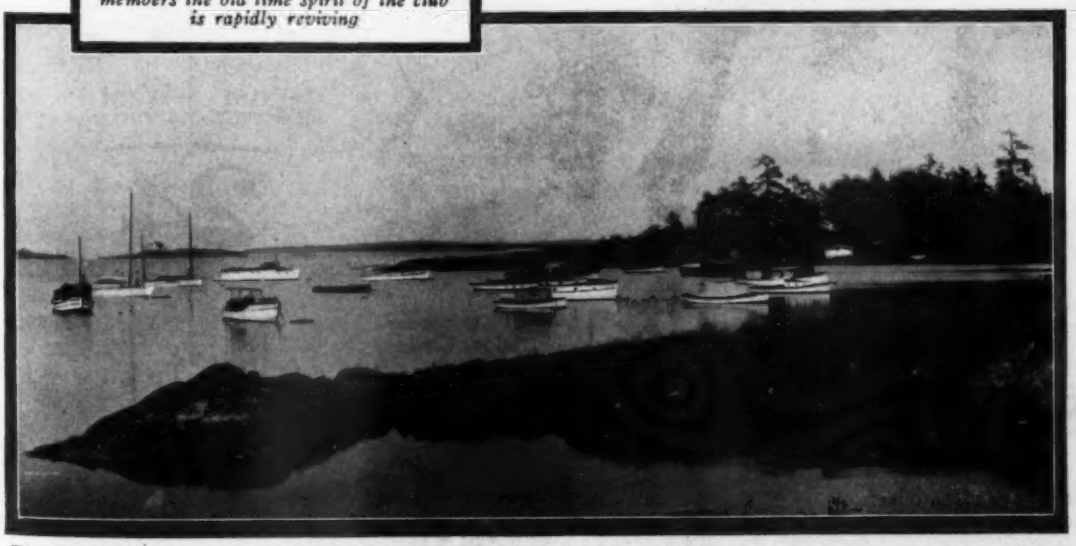
The Royal Victoria Yacht Club, of Victoria, B. C., Sent 90 of Its 225 Members to the Front—Some Are Sleeping Under the Restless Waves While Others Lie in Flanders Fields



The clubhouse is situated at Uplands on Cadboro Bay, Straits of San Juan de Fuca

A corner of the club grounds. Yachting here has been non-existant during the war, but with the return of the members the old time spirit of the club is rapidly reviving

It is a spot that has been treated kindly by Mother Nature



The mooring ground from which one may start on an inland cruise of 1,200 miles. The average man can cruise a lifetime and still find new courses

Graphic Navigation

An Illustrated and Diagramatic Description of Methods by Which the Position of a Ship at Sea May Be Determined Without the Use of Higher Mathematics

By Capt. A. C. Knight

II—DETERMINATION OF LONGITUDE BY A TIME SIGHT

This is the second instalment of Capt. Knight's series of illustrated articles on Navigation. Part I, which was published in the February issues of MoToR BoatinG, described graphically the determination of latitude by meridian altitude of the sun. Those who followed Part I saw how easily and readily latitude could be obtained by noon sights with very little figuring.

Naturally, the next step now that one's north and south position has been located is to find how far east or west of a given point he is. Therefore, by following the diagrams in this month's instalment we will be surprised how easily it is to determine longitude. Part I should be continually referred to as the whole series forms a succession of continuous steps, rather than being individual units in the study of navigation.—Editor.

FIG. 12

IF a clock with a 24-hour dial be placed at the north pole with its hour hand pointed toward the Sun, it will practically continue to point toward the Sun as long as the clock keeps correct time. If the hour hand also points to exact noon on the dial when the Mean Sun (a fictitious Sun made to cross at regular intervals) crosses the Greenwich Meridian, it will be keeping Greenwich Mean time.—G.M.T.

2. We see, therefore, a relation between Time and Arc in this case and the relation is at the ratio of 15 degrees of Arc to 1 hour of Time, —15 minutes of Arc to 1 minute of Time, and 15 seconds of Arc to 1 second of Time.

3. It follows that we can look at such a clock (chronometer) keeping Greenwich Mean Time and tell by it which Meridian the Fictitious Sun is intersecting at each instant. In other words, we thus locate the Sun's Hour Circle, Fictitious and Real, providing we make allowance for any slight difference of time the Real Sun may be either ahead or behind the Fictitious Sun (chronometer) in their race around the circle.

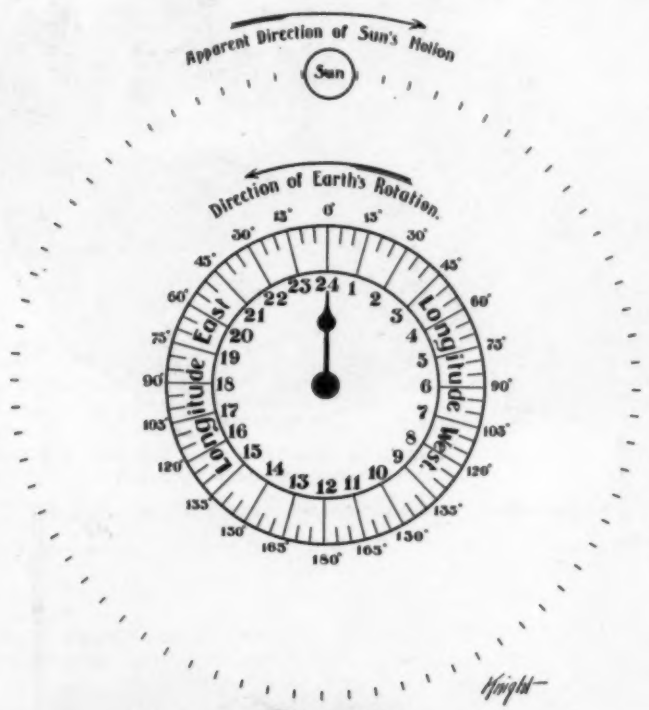


Fig. 12.

FIG. 13

4. This difference in time between the Real Sun and the Fictitious Sun (chronometer) caused by the Earth having an elliptical orbit and. moreover, traveling on it in an inclined position, is called the Equation of Time. By applying the Equation of Time to Mean Time (chronometer time) plus or minus as indicated in the Nautical Almanac, we get True Sun Time, which is called Apparent Time.

FIG. 14

5. The Plane of the Meridian of Greenwich, by common consent the Prime Meridian (First Meridian), projected out into space, becomes the Plane of the Celestial Meridian or Hour Circle of Greenwich.

6. The Plane of the Meridian of the Observer projected out into space becomes the Plane of the Celestial Meridian or Hour Circle of the Observer.

7. The Plane of that Meridian, which, projected out into space, would intersect the True Sun at its center, is the Hour Circle of the True Sun.

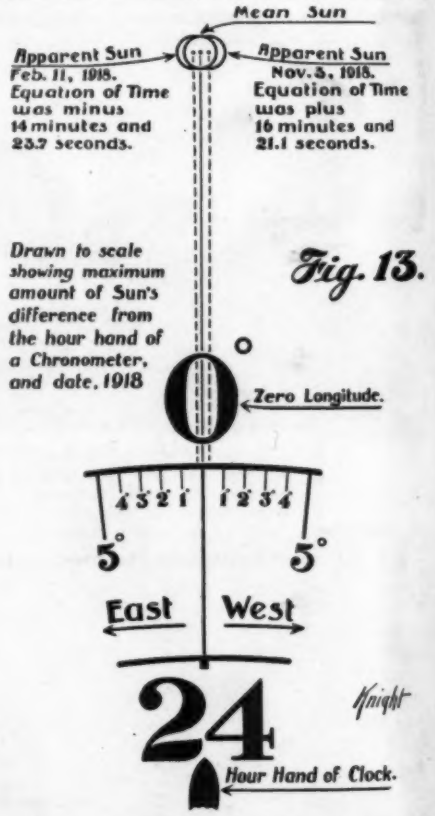


Fig. 13.

8. The angular distance, measured in time, toward the west, between the Hour Circle of Greenwich and the Hour Circle of the True Sun, is the Hour Angle of the True Sun from Greenwich and is Greenwich Apparent Time,—written G.A.T.

9. The angular distance, measured in time, toward the west, between the Hour Circle of the Observer and the

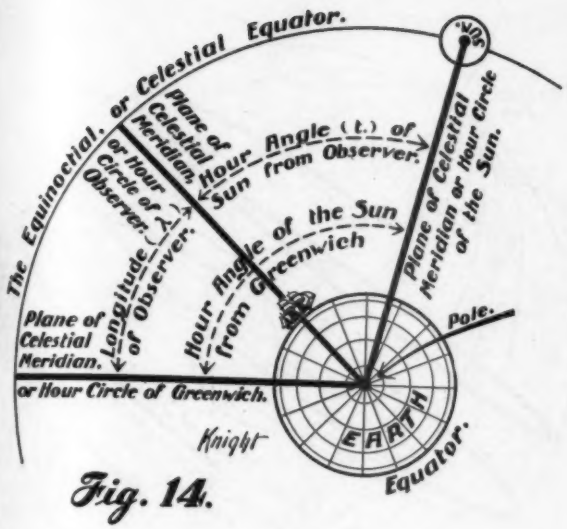


Fig. 14.

Hour Circle of the True Sun, is the Hour Angle of the True Sun from the Observer (t) and is Local Apparent Time,—written L.A.T.

10. Longitude (written thus (λ) when expressed in time) is the difference between Greenwich Apparent Time, (G.A.T.) and Local Apparent Time, (L.A.T.) or the angular difference between their corresponding Hour Angles, taken at the same instant of time.

11. When the Greenwich time is later, or greater, the longitude is West. To get the longitude, subtract local time from Greenwich time.

FIG. 15

12. P.M. Sight—

Greenwich Astronomical Time is July 15, 9^h.

Local Astronomical Time is July 15, 4^h.

Greenwich Time is later or greater, therefore Longitude is West.

Thus,—G.A.T. 9^h minus L.A.T. 4^h equals λ 5^h west.

FIG. 15a

13. A.M. Sight—

Greenwich Astronomical Time is July 15, 5^h.

Local Astronomical Time is July 14, 20^h.

Manifestly it cannot be July 15 locally till the Sun crosses the local Meridian. Greenwich Time is already 5^h on the 15, and the same instant, reckoned from the 14, would be 24 hours more, therefore July 15 5^h equals July 14 5^h plus 24^h or July 14 29^h. The problem now reads:

Greenwich Astronomical Time is July 14, 29^h.

Local Astronomical Time is July 14, 20^h.

Greenwich Time is later or greater, therefore Longitude is West. Thus—G.A.T. 29^h minus L.A.T. 20^h equals λ 9^h west.

Fig.15.

Fig.15a.

14. When the Local time is later, or greater, the Longitude will be East. To get the Longitude, subtract the Greenwich time from Local Time.

Fig.15b.

Fig.15c.

FIG. 15b

15. A.M. Sight—

Greenwich Astronomical Time is July 15, 15^h.

Local Astronomical Time is July 15, 20^h.

Local Time is later, or greater, therefore Longitude is East. Thus—L.A.T. 20^h minus G.A.T. 15^h equals λ 5^h east.

FIG. 15c

16. P.M. Sight—Greenwich Astronomical Time is July 15, 19^h. As the Sun has already crossed the Local Meridian, but has not yet reached the Greenwich Meridian, the Local Date is July 16 4^h Astronomical Time, or July 15, 4^h plus 24^h, or July 15 28^h.

Local Time is later or greater, therefore Longitude is East. Thus—L.A.T. 28^h minus G.A.T. 19^h equals λ 9^h east.

17. It is an established rule that it is always later at Greenwich than at any place in West Longitude, and always earlier at Greenwich than at any place in East Longitude.

EXAMPLE

FIG. 16

18. FIRST STEP—Tabulate the Data. Five Parts Necessary

1. The Date, July 15, P.M., 1918.
2. The Latitude (by Dead Reckoning), 28° 15′.5 north. See Fig. 16.
3. After having subtracted the time of Watch from the time of Chronometer the remainder is Chronometer minus Watch, C—W, 6^h 30^m 15^s.

   This is done because we may not carry the Chronometer out on deck and use it.
4. Height of eye above the water, 50 feet.
5. The error of the Chronometer itself, whether it is fast or slow, called Chronometer Correction, C.C., plus 32^s.

   Indicating Chronometer was slow.

Showing Chronometer and Watch at the time subtraction was made.

Fig.16.

Greenwich Mean Time.

Ship's Time.

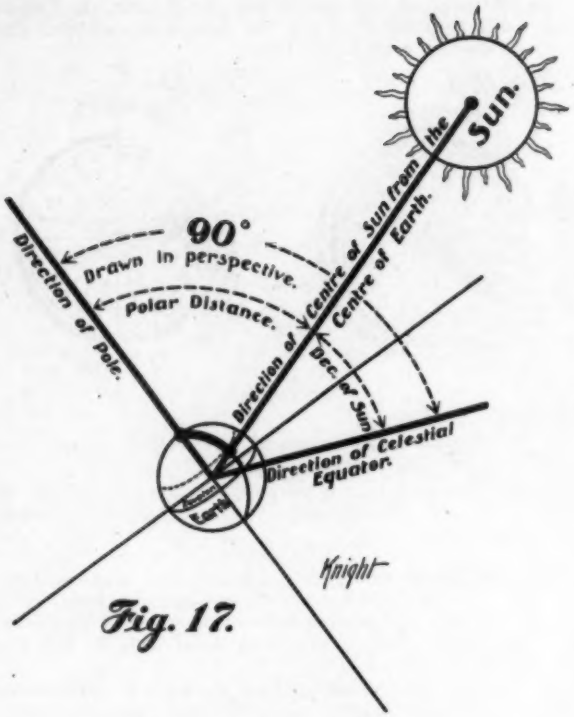
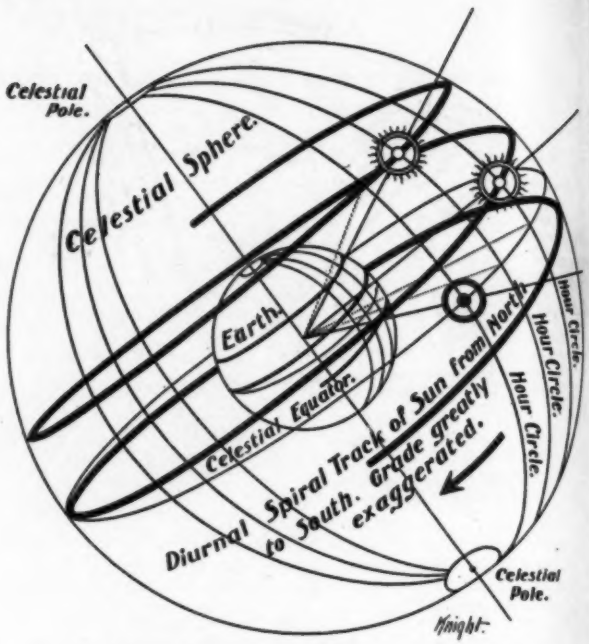


Fig. 17.



It is convenient to regard the Sun as circling around the Earth, rather than the Earth's diurnal rotation.

Fig. 18.

19. SECOND STEP—Take the Sights. Same Process as for Latitude

By taking three Sights and carefully noting time of each on Hack Watch the average between them may be considered more accurate than one single Sight. Thus:

Obs. Alt. ☉	30° 18′ 20″	at	W.T. 4h 1m 12s
Obs. Alt. ☉	29° 47′ 50″	at	W.T. 4h 3m 32s
Obs. Alt. ☉	29° 26′ 10″	at	W.T. 4h 5m 13s
Sum divided by 3.	88° 91′ 80″	at	W.T. 12h 9m 57s

Average

Obs. Alt. ☉ 29° 50′ 46″.6 Average W.T. 4h 3m 19s

20. THIRD STEP—Get the Corrected Altitude of the Sun (h), as previously explained in Article on Latitude

Obs. Alt. ☉	29°	50′	46″.6
I.C. ∓ (none)			00″
	29°	50′	46″.6
Dip. —		6′	56″
	29°	43′	50″.6
Ref. —		1′	41″
	29°	42′	9″.6
Par. +			8″
	29°	42′	17″.6
S.D. +		15′	46″
h ⊙	29°	58′	3″.6

21. FOURTH STEP—Get the Greenwich Mean Time (G.M.T.). Thus:

W.T.	4h 3m 19s	
C-W +	6h 30m 15s	
Chro. T.	10h 33m 34s	As registered by Chro. at time of Sight.
C.C. +	32s	Amount Chro, was slow.
G.M.T.	10h 34m 6s	Correct Greenwich Time.

FIG. 17

22. Actual position of the Sun with reference to the Earth when the Sun is in North Declination (+).

Take notice that no material change whatever takes place in any part when we project every line upon the Celestial Sphere.

See following drawings:

23. FIFTH STEP—Get Equation of Time and Declination of the Sun

FIGS. 18 AND 18a

The Equation of Time and the Declination of the Sun will be found in the Nautical Almanac.

For July 15th, 10h

Equation of Time	—5m 44s.4
Hourly Diff. increasing, 0s.3—for ½ hour	= + 0s.15
Equation of Time for 10h 30m	—5m 44s.55

For same day and time

Declination of the Sun	+ 21° 33′.5
Plus meaning north.	
Hourly Diff. decreasing, 0.4′,—for ½ hour	= —0′.2
Dec. for G.M.T. 10h 30m	+ 21° 33′.3
Or	+ 21° 33′ 18″

24. SIXTH STEP—Get Greenwich Apparent Time. (G.A.T.)

G.M.T.	10h 34m 6s
Eq. t.	— 5m 45s
G.A.T.	10h 28m 21s

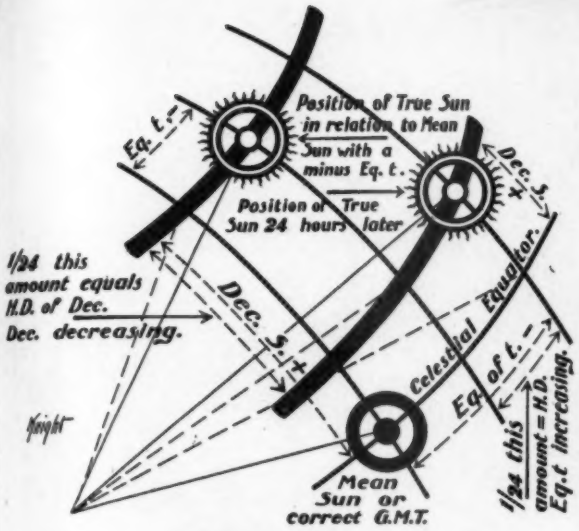


Fig. 18 a.

FIG. 19

25. SEVENTH STEP—Get Polar Distance

The general formula for computing the Hour Angle is:

$$\text{Cos. Hour Ang.} = \frac{\text{Cos. Zenith Dist.—Cos. Polar Dist. Cos. Co.-Lat.}}{\text{Sin. Polar Dist. Sin. Co-Lat.}}$$

One side of the Astronomical Triangle is here shown,—namely, the Polar Distance, written (p).

Subtract the corrected declination from 90 degrees and the remainder will be the Polar Distance. 90° — Dec. = p.

Thus	90	00′	00″
Dec.	21°	33′	18″
p	68°	26′	42″

FIG. 20

26. Another side of the Astronomical Triangle here shown is the Zenith Distance, written (z).

Zenith Distance is obtained by subtracting the Corrected Altitude (h) from 90 degrees. 90° — h = z.

This operation is not performed for the reason that the Sine of the Complement of the angle (Corrected Altitude, h, which we already have) equals the Cosine of the Zenith Distance.

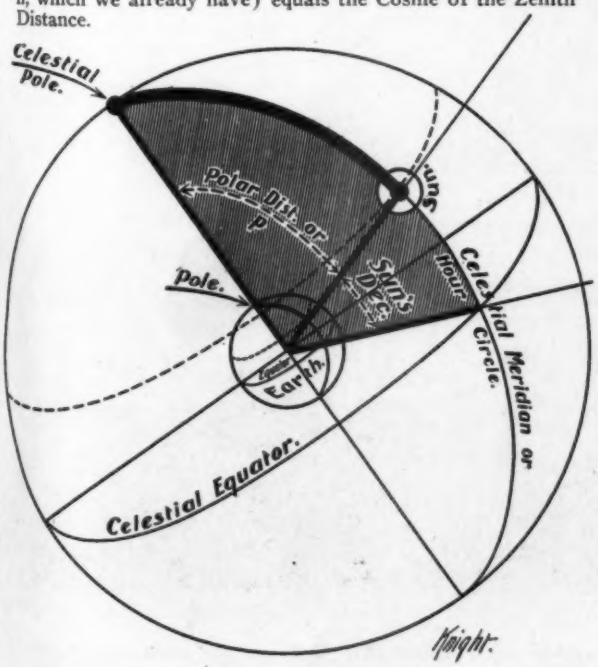


Fig. 19.

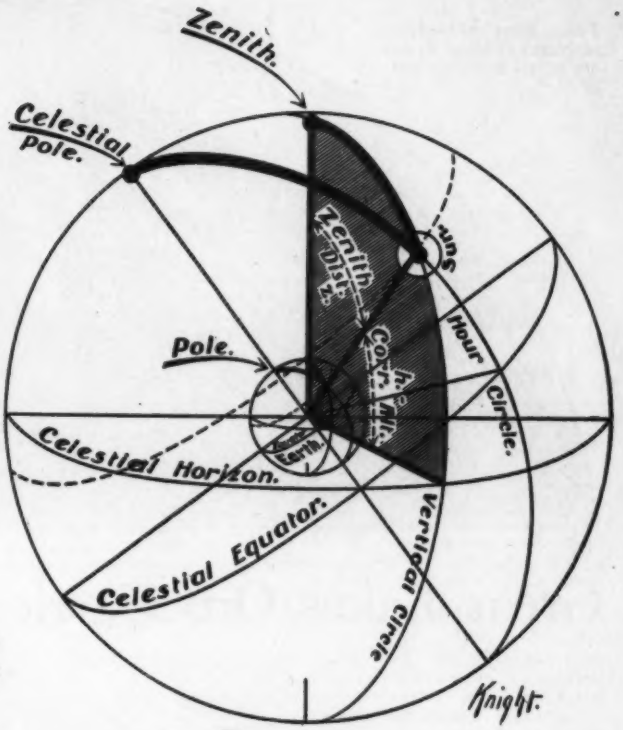


Fig. 20.

FIG. 21.

27. The third side of the Astronomical Triangle, the Co-Latitude.

Co-Latitude is found by subtracting the Latitude from 90 degrees. 90° — Lat. = Co-Lat.

Since the Sine of the Latitude equals the Cosine of the Co-Latitude, use the former. Same reason as before. It is convenient.

(*Continued on page 58*)

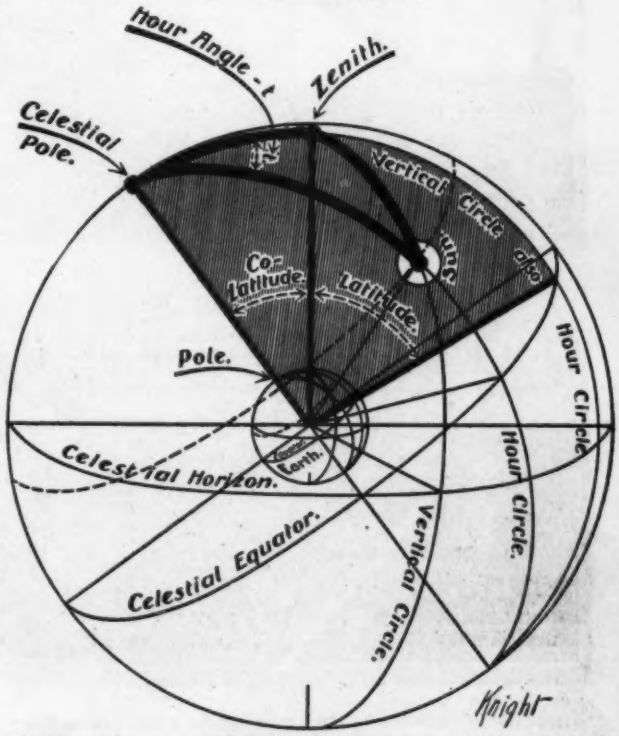
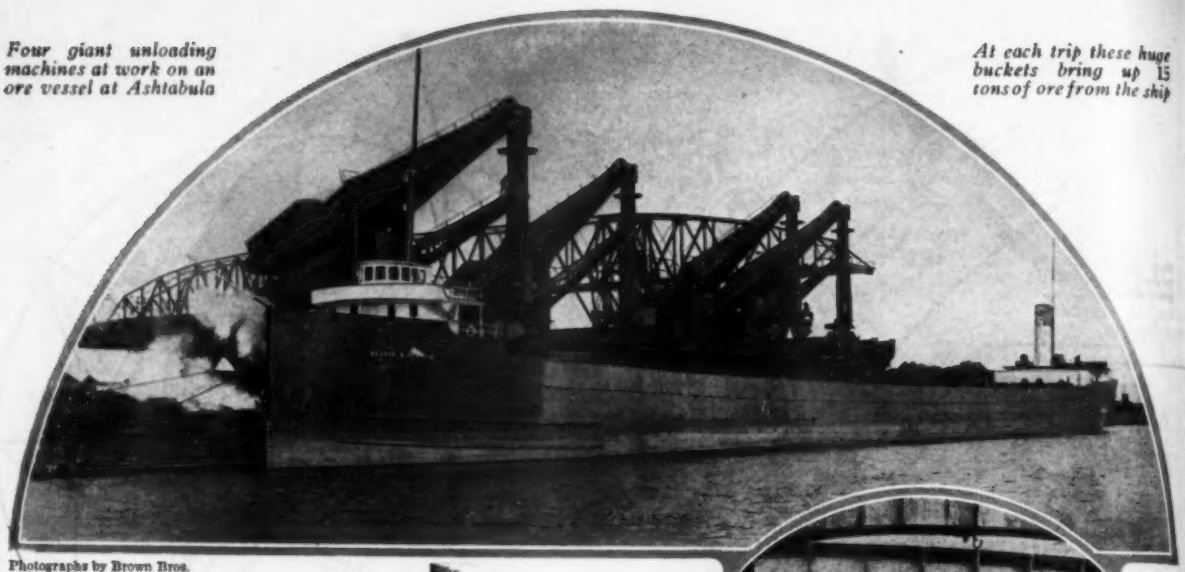


Fig. 21.

Four giant unloading machines at work on an ore vessel at Ashtabula

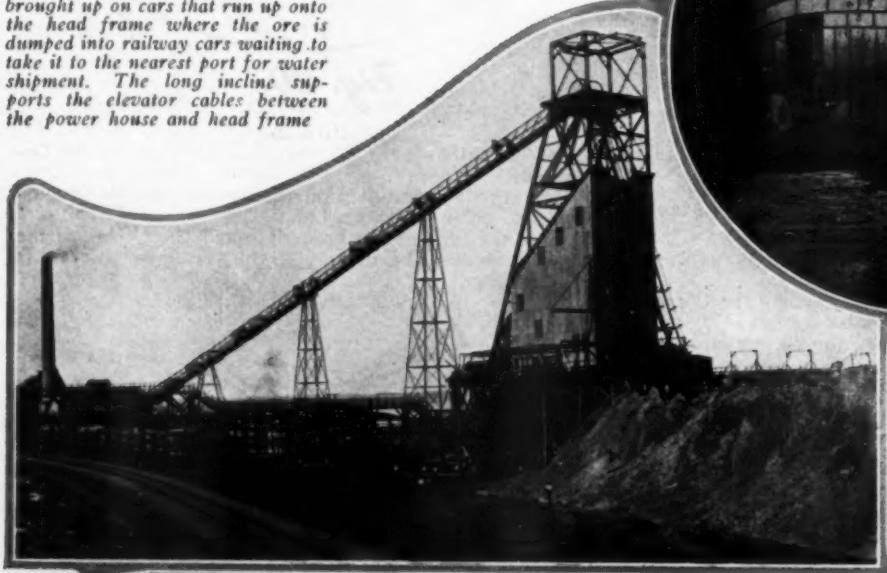
At each trip these huge buckets bring up 15 tons of ore from the ship

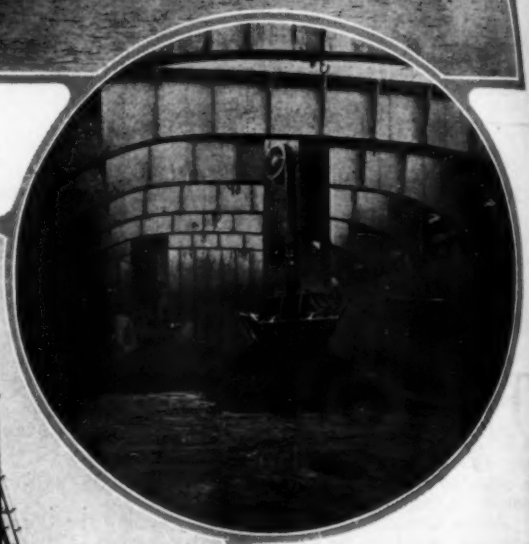


Photographs by Brown Bros.

Great Lakes Ore Carriers

Iron ore from the deep mines is brought up on cars that run up onto the head frame where the ore is dumped into railway cars waiting to take it to the nearest port for water shipment. The long incline supports the elevator cables between the power house and head frame





The illustration above shows two unloader buckets in the hold of an ore vessel about to pick up their loads of ore. The operation of each of these buckets is controlled by the operator who rides in a cab just above the bucket. They can be seen looking out of the oval openings

As navigation is closed by the ice during the winter, enough ore must be stored in stock piles on the ore dock during the summer to keep the iron and steel mills going during the winter months. The ore in these stock piles is handled by large gauntry cranes

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions to be Answered in the May Issue

1. How is the best way to obtain say a 25-foot motor boat? Buy completely equipped; buy parts and assemble; have built to order, or buy second-hand and remodel? What has been your experience?
(Suggested by L. R. L., Columbus, O.)

2. Describe and illustrate the construction of the best windshield, glass front or other protection, for the forward end of the cockpit of a small raised-deck cruiser. Also tell why you prefer it.
(Suggested by C. H. C., Saginaw, Mich.)

3. Illustrate and describe in detail how to alter an outboard motor into a successful inboard motor for installation in a light skiff. *(Suggested by C. E. B., Fall River, Mass.)*

Rules for the Prize Contest

ANSWERS to the above questions for the May issue addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before March 25; (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before March 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us.

Racing Depends Upon Naval Reservists for Revival

Answers to the Following Question Published in the January Issue

"Will long distance racing for cruising boats be revived when motor boating gains its normal activity and state your reasons for your belief"

Navy-Yachtsmen Will Revive Racing

(Prize Winning Answer)

TO a casual observer the decline in long distance racing during the past few years would be somewhat of an enigma. Only those who have actually had a hand in the sport are able to account for the fact that interest in long distance contests has almost dropped to the zero point. In order to discuss the probable return of interest we must analyze the causes of the decline.

In the first place the average cruising boat that is capable of going to sea and staying there for any number of days is naturally a boat that is also well suited to ordinary afternoon and week-end trips, and as a rule is kept in such condition that short cruises can be made in comfort by all members of the owner's family—in other words there is considerable equipment installed for the benefit of ladies and such other members of the usual party that like to take their boating in very gentle doses. Such equipment includes awnings, fancy deck furniture, carpets, fine crockery, etc. These articles are not suited for offshore trips to Bermuda or Havana, or even Block Island. This means that the boat will have to be stripped of awnings and such other equipment that is not stable and strong enough to withstand the buffeting of heavy seas. To take this stuff off a boat and replace it with heavier parts requires much time and expense. Owners were loath to lay their boats up in midseason at some yard and have the fittings removed, the bottom cleaned and painted, the machinery gone over, and all other necessary work done to put the boat in shape for the long grind. It must also be borne in mind that accommodations for a larger crew than would usually be carried, must be made. Often gasoline and water tanks have to be increased in size and new piping installed. Taking the Bermuda, Havana, and Halifax races as examples, it was necessary to spend about a week putting the boat in shape for the race, approximately a week racing and the resting up in port afterwards; another week returning to the home port and finally a week or more to replace the fittings required for the usual cruising. At least a month's time when the boat will not be of service to the less venturesome of the family.

The second great point was the difficulty of obtaining a sufficient number of men for the crew. They had to be able to spare the time, and also had to have considerable experience. The combination was hard to find. On even the smallest boat capable of going to Bermuda, six men would be needed, and eight would be better. Of these men, three should be engineers capable of handling gasoline motors in heavy weather. They must understand emergency repair work, one should be the sort of a cook who can hold the pots on the stove, one should be a man who can handle the sextant and make any of the calculations that come under the head of celestial navigation, and the rest must be men who can steer their "four hours on" watch after watch without becoming more than decently seasick. Time and again boats went to Bermuda with crews that were absolutely unfitted for the work. One or two real sailors in the party had to do all of the real work during the passage. Naturally owners became disgusted with the troubles incident to such contests.

Upon what basis can we look for a return of the sea races? The answer is the Naval Reserve Fleet. We motor boatmen know perfectly well that no man can go to sea in a boat such as the chasers and patrol vessels with which we have been scouring the sea, and come back after it is all over without having an intense love of the sea and of the motor boat. Many of these boys are going to get boats as soon as they are mustered out of the service. It is only natural that they will want their own boats to have as far as possible the same equipment with which they became familiar during their hitch in the service. Consequently their boats will not be loaded down with a lot of frumperies and ginger bread work designed to look pretty but to be useful in light conditions of service only. This means that these boats will be ready to go to sea at short notice. Instead of taking week-end trips up some gentle river these boys will want to go off shore every week-end. They will require large tanks and real sea-going equipment generally.

As far as getting men to handle the boats is concerned, the greatest trouble will be in having to refuse so many of those that will want to make the trip. Thousands have been taught navigation by the Government and by the Power Squadron Schools. Thousands have been out to sea on the chasers in all sorts of weathers and have acquired sea legs and sea stomachs. They will be the sort of men who can sleep in comfort on the deck with oilskins and hip boots. Instead of being rather backwards about spending a month of more or less trying conditions, they will be looking forward to that month as the one time of the year when they can get out and have a real good time.

G. T. W., Yonkers, N. Y.

New Blood Is Racing's Only Hope

IT will have to be a pretty big event to cause a revival in long distance motor boat racing, so perhaps when conditions become normal it will be found that the war created a jolt of sufficient force to put the thing across in proper style. Normal conditions, as far as yachting in this country is concerned, existed until the summer of 1917; yet for a number of years prior to that date, it was a difficult matter indeed to pull off a long distance race with any chance of success.

Long distance racing can hardly be called a sport. It is more in the nature of a fad or craze. Furthermore, there is too much hard work connected with it, provided you do it right; and the cost is a consideration, as well. Pastimes of this nature, when once the novelty wears off, can seldom be brought back to their initial standing.

It is claimed by some that long distance motor boat racing is too mechanical; that there is an insufficient element of chance connected with it; or there is too little opportunity to introduce skillful tactics. But if this were true, then why did long distance sail boat racing peter out as it did a dozen years or more ago? Here is a sport which fairly bristled with opportunities to show one's skill and where chance played a large part; yet the interest died out.

On the other hand, sail boat racing, over ordinary courses, has always created intense interest; not necessarily among those actually taking part, but among the public in general. There is apparently nothing to prevent this interest from continuing indefinitely; yet the average motor boat race is seldom given the slightest consideration nowadays. Even the one or two championship races which are staged annually, arouse little or no enthusiasm among yachtsmen; the main reason being that in order to participate, one must be either a millionaire or connected in some way with the commercial end of the game. Racing of this kind is anything but wholesome.

Now, in view of these conditions, one might say that the outlook for long distance motor boat racing (or, in fact, any kind of motor boat racing) does not present a very rosy aspect. One might go so far as to safely predict that normal conditions, even, could not possibly create a future for this phase of the game. But are conditions going to be normal, as we knew them before the war? No! They are going to be abnormal, and in the right direction this time; so perhaps there may be something doing in the long distance line, after all.

The boating game is about to be bolstered up in manner never before dreamed of. There are thousands of young naval men who, in a short time, will become yachtsmen. Here is a new class who know the ropes from A to Z, and, better still, who are full of vim and enthusiasm, which is natural with youth. The majority of these lads are still in their teens. Surely from such material, one can expect great things; and even though many of these fellows may be unable as yet to have their own craft, there should be no complaint over a shortage of crews among the boats which show up at the starting line.

But if a spurt of this nature actually does take place, it somehow seems as though, sooner or later, the old cruiser would again fall back into its long accustomed habits. Will it not be content to give way to the high-powered open racer, while it loafs along, enjoying the multitude of pleasures which seem so much a part of this type of craft?

F. T. L., New York, N. Y.

Racing Develops Power Plants and Seamanship

LONG distance racing should come into its own during the next few years for the following reasons:

First, because we are all going to be more interested in reducing the time it takes to travel from place to place than in the speed we may attain in going a short distance with no object excepting speed in mind.

Second, because the long distance contests will bring into the field more representative and useful craft.

Third, because this sort of contest develops something besides the mechanism—it develops seamanship.

A great many young men are going to return from the Navy to civil life. They have learned many things about sea craft and many will be anxious to keep up some sort of activity on the water. With the large inland lakes and rivers, as well as the great sea coast of our country, there is the greatest opportunity for long distance cruising. Much of this can be turned to commercial advantage.

Long distance racing did more to perfect the stock motor car than track events. This was so because the long distance, or endurance run, met every day conditions.

The high-speed motor car for track racing is a freak—just so the high-speed motor boat. Not so the cruiser which can meet conditions as they arise one day after another.

New things have been learned about motor boats and thousands of boats have been built. Prices should be lower within the year, due to present increased production and more economical designs. Heavy fuel engines have been perfected and should become popular. All in all there are many things that should make long distance cruising popular.

L. R. L., Columbus, Ohio.

Care Essential in Fitting Piston Rings

Answers to the Following Question Published in the January Issue

"Give in detail, the procedure for fitting new piston rings correctly, not alone the installation, but methods of obtaining correct fitting at the sides, face, and joint to eliminate possible sources of gas leakage. Illustrate if possible."

Follow the Manufacturer's Directions

(The Prize Winning Answer)

THE first thing to do is to decide upon the type of ring you will use, and in this connection it is advisable to look over the catalogs of patented rings. Some of these special makes are used on the best engines, and in case such a ring is selected full information covering installation will be furnished by the manufacturer.

Ordinary rings are made in two types, shown in Fig. 1, and for obvious reasons the "Step Joint" is generally preferred, although if carefully fitted the angle joint preferred will give satisfactory results.

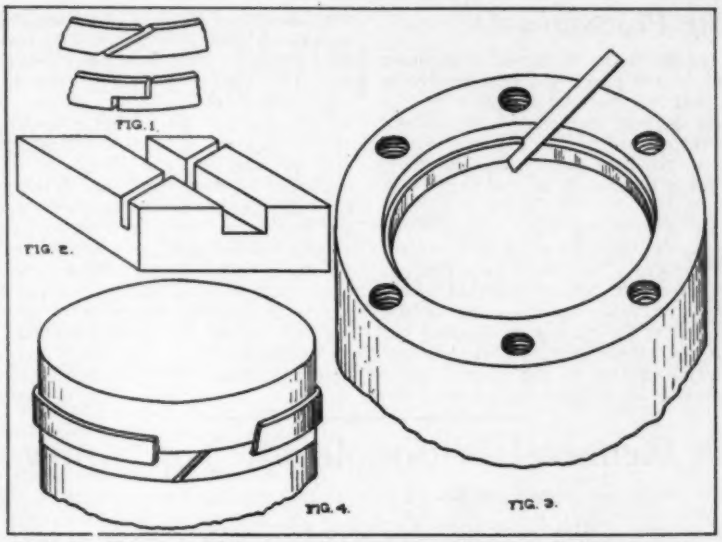
Whatever make is decided upon, it may be necessary to lap the rings slightly, and for this purpose a piece of emery cloth tacked to a carefully trued piece of board is utilized. Six pieces of tin ½-inch wide by 6 nches long will be useful and an 8-inch flat fine file should be at hand. Also provide a piece of sheet metal .010 inch thick, about ½ x 2 inches for gauge. In case the angle joint ring is used, the filing jig shown in Fig. 2 will prove useful. This consists of a piece of hard wood with two grooves, one for the ring and the other for the file. Work upon but one cylinder at a time, and in removing a piston carefully mark the bearing parts and piston, in order that they may go back in their original positions.

Remove the old rings, scrape the top of the piston clean and replace the piston in the cylinder, turning the crankshaft so the top of the piston will be about ½-inch from the top. Press a ring down snug on top of the piston and, if necessary, file the ends until the .010 gauge may be just slipped between. This is to provide for heat expansion. The method is shown in Fig. 3. Prepare all

the rings for this particular cylinder in this way and then remove the piston.

Try the new rings in their respective grooves by rolling them around the outside of the piston. If they are tight, rub them on the emery block, using a circular motion with even pressure.

Slip the first ring over the top of the piston and into the first groove. With a string or elastic band position four or five of tin strips around the piston over the ring just placed and slip the second ring over the whole. The strips enable the second ring to be slid along over the first one. Proceed the same way with the remaining ring. It is really simple.



F. A. Y.—Rings should be pressed down snug after the old rings have been removed and the top scraped

It is important before replacing the piston to revolve the rings until their openings are staggered as much as possible. Break off the ends of an old ring until about three quarters remain for use as a clamp for compressing each ring as it enters the cylinder. The stunt is shown in Fig. 4.

After installing the piston, squirt a little oil between it and the cylinder and be sure that the crankcase has a full supply. Great care should be taken not to run the engine beyond low speed for about two hours, stopping every ten or fifteen minutes to allow the cylinder to cool a little.

F. A. Y., Meriden, Conn.

Exactness of Fit Important

ASSUMING that the piston is finished turned or ground to the exact required diameter with the ring slots or grooves carefully cut, and further assuming the cylinder bore to be perfectly round and of the same diameter throughout, the following procedure of fitting piston rings will be quite in order.

First of all, since the piston rings are a sort of valve designed to tightly close the space between cylinder and piston walls, the exactness of fitting must be especially adhered to: The most common method of making the rings is to turn them from what is known as a pot casting. This is simply a rough cylindrical gray iron casting similar in shape to a short length of pipe, but without flanges.

A portion of the casting of sufficient length to make the required number of rings is turned to a diameter considerably larger than the bore of the cylinder. In many machine shops this turned diameter is approximately a size one-thirtieth inch or thereabouts larger than the bore of the cylinder in which the rings are to go.

The rings are then parted off individually to a width considerably greater than the slots of the piston. After parting off each ring, a small portion is sawed out at one place and the joint or lap carefully filed. This cut-out portion should be such as to still leave the ring, with the joint filed to shape, about one-sixteenth inch larger in diameter than the cylinder bore when the ring is compressed or clamped together for final turning.

With the ring gripped closely together in a clamp the work is carefully set in the lathe chuck and finish turned to the required size for proper working in the cylinder, viz, a shade under the cylinder diameter.

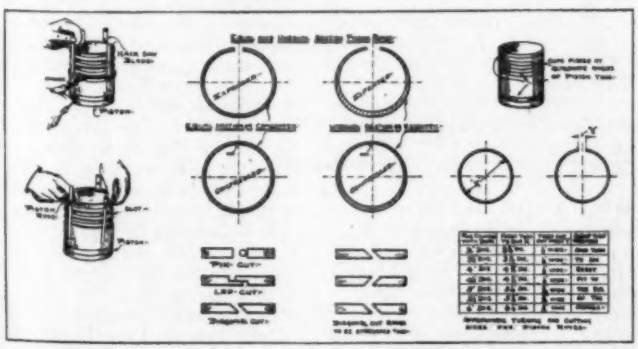
The edges of the ring are then finished off very squarely to a width suitable for easy entrance to the ring slots of the piston. The square edge ring allows same to scrape up before it the thin film of lubricating oil on the cylinder wall, thus further aiding in the making an air-tight joint through the oil acting as a seal or packing.

There are numerous styles or types of rings of both simple and elaborate design, but those most commonly found in standard stock marine engines are either the equal section (concentric rings) or the unequal section (eccentric rings).

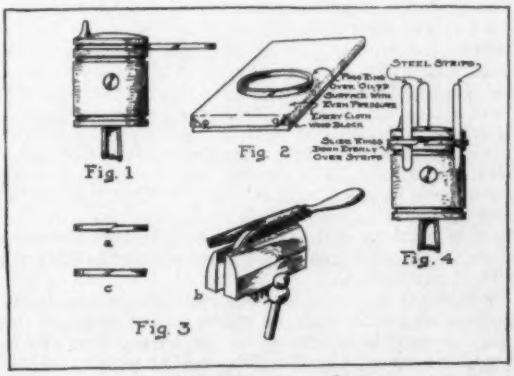
The accompanying sketches illustrate the rings and joints as here described, while the tabulated figures will give the different approximate measurements for turning rings of several sizes. I have shown both the equal and unequal section rings and have given examples of the pin cut, lap cut, and diagonal cut. After completing the ring it is quite necessary to handle them in a careful manner to avoid breaking when putting them on or taking them off the piston. For this purpose three or four short pieces of hacksaw blade or strip tin can be used to advantage in the manner also indicated in the sketch.

While the operations here given are perhaps not so elaborate as those employed in establishments making a business of producing piston rings with special machinery for the purpose, nevertheless they will suffice for the securing of an elastic ring capable of following the cylinder wall and retaining the compressed gas above the piston.

C. E. B., Fall River, Mass.



C. E. B.—Illustrates in detail the importance of an exact fit



F. E. F.'s easy method

An Easy Procedure

TO obtain the best results in the fitting of new piston rings, it becomes necessary to use the utmost care in selecting the ring that fits the best in either of the piston ring grooves. To do this, carefully sort out the rings. When the one is selected to fit one of the grooves, roll it around the piston in the ring groove starting from the opening of the ring, going completely around the piston, as shown in Figure 1.

If the ring is too wide, use emery cloth with oil and proceed as shown in Fig. 2. Be sure that all piston grooves are free from dirt and carbon. The next, and perhaps most important operation, is that of fitting the ring to the cylinder. It is very important that this procedure should have unlimited attention. It is the means of keeping the ring in a correct position against the walls of the cylinder.

If the ring is too large, as shown in Fig. 3 (a), use a thin file of very fine cut and file evenly the ends of the ring, as shown in (b). Each ring should be fitted into the cylinder without the piston, and feel the ends to determine the amount of filing to be done to bring them down to a good fit. The ring will always have a gap between the ends when not in the cylinder. Figure (a) shows the ring as it will feel to you in the cylinder when it is too large, (b) shows the process of filing, and (c) is the natural way the ring looks at all times. Extra caution should be exercised in using each ring in the groove it has been fitted to. It is often seen that rings are fitted to one groove and put to use in others where they were not fitted; this results in leakage of gas, which means loss of power. Piston rings should be put on the piston, as shown in Fig. 4, using care to keep them from getting cocked or, in other words, from being forced more on one side than the other.

Good results are always possible to obtain where care and caution are used. The fitting of rings is one of the most important parts of engine work.

F. E. F., Springfield, Mass.

Carbon Removal Is Simple—If You Know How

Answers to the Following Question Published in the January Issue

"Have you had any luck in removing carbon by means of injecting water into the cylinder? If so, tell how you work it.

A Home-Made Device

Prize-Winning Answer

THE number of patented devices on the market for the removal of carbon from a gasoline motor by the addition of water to the fuel charge; and at the same time improving the operation of the motor, would seem to prove the value of this method.

Have you not noticed how much steadier and quieter your motor runs on a hot foggy night; and that the spark could be advanced farther without causing knocking? The moisture of the air is drawn in through the carbureter air intake and being finally divided is broken up into its elements hydrogen and oxygen, which unite with the mixture of gasoline vapor and air, causing cleaner combustion, preventing the formation of carbon, and there may be some oxygen that will combine with the red hot carbon particles forming water gas with the hydrogen present. The water gas burns supporting the explosion and the products of the explosion (clean combustion are carbon monoxide or carbon dioxide and are carried out with the exhaust).

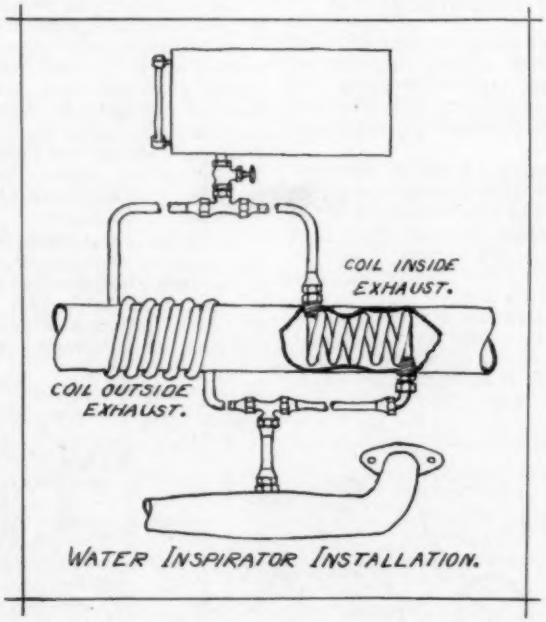
Flue gas analysis proves that any carbon monoxide which passes from the combustion chamber before it has combined with the other molecule of oxygen necessary to form carbon dioxide is a loss and to a great extent preventable under proper handling of conditions.

Chemically, gasoline is carbon (c) and hydrogen (H) in varied proportions. Air is almost one-fifth oxygen (O) and four-fifths nitrogen (N). The nitrogen is inert and passes off uncombined. Water is a combination of hydrogen (H) and oxygen (O) requiring intense heat, and the presence of other elements for them to combine with, to break it up into its elements. All of these elements except nitrogen are combustible when in correct proportions.

Water gas, commonly called illuminating gas, is made by passing steam through an incandescent mass of burning coal, where it is broken up by the intense heat into its elements hydrogen (H) and oxygen (O) which combine with the carbon (C) of the coal forming water gas ($2H + CO$) or hydrogen (H) and carbon monoxide (CO). This gas burns with a non-illuminating flame and for illuminating purposes is enriched by the destructive distillation of an oil containing the light-giving elements. This is practically what happens when the water vapor is admitted to the red-hot carbon in the cylinder of a motor.

You can buy any of the manufactured devices for supplying the water vapor or steam or you can rig up your own inspirator. Liquid water will do more harm than the carbon you are trying to get rid of, so don't squirt water into the air intake hoping to clean out carbon. The water must be vaporized, turned to steam, superheated steam if possible.

The only articles necessary to make a water inspirator are a small tank having a gauge glass, a length of ¼-inch O. D. annealed copper tubing and some fittings. Around the hottest part of the exhaust pipe, that is close to the motor, wind several turns of the tubing, allowing enough to connect to the tank and the carbureter.



WATER INSPIRATOR INSTALLATION.

On the tubing place a piece of sheet brass and over this an insulating layer of asbestos cement. Slightly higher than the coil locate the water tank which is connected to the coil through a needle valve. Use only fresh water, as salt water would leave a deposit like scale.

Where results are the main object and time only a secondary consideration the coil may be placed inside the exhaust pipe, where its action will resemble that of a flash boiler, fumes being good lively steam that is nearly dry. Two tubing unions of the compression type tapped into the exhaust pipe will make gas-tight joints and facilitate installation.

Opinions differ as to where the steam is to be admitted to the intake, but there seems to be little difference in the results whether it is taken in through the carbureter air intake or admitted directly to the manifold. By using a hot air intake to the carbureter there would appear to be an advantage to admitting the water vapor directly into the intake manifold.

(*Coninued on page* 84)

W. B. M. — Be careful not to squirt water into the air intake as sometimes water will do more harm than the carbon you are trying to remove

The Oil Cup Method

MY first experiment of injecting water into the cylinders to facilitate the removal of carbon consisted of a large oil cup (Figure 1) fitted into the casing surrounding the exhaust pipe and supplying hot air to the carbureter. This was done by simply drilling and tapping the casing to fit the pipe thread on the oil cup. This cup was easily kept filled with water by connecting it with ⅛ inch piping to the fresh water tanks. By means of the needle valve on the oil cup, water was allowed to drip on the hot exhaust pipe forming steam which was sucked into the cylinders by means of the flexible pipe connecting the hot air casing with the air intake on the carbureter.

This simple device certainly kept the cylinders clear of carbon, but had no other advantages over the action of the motor.

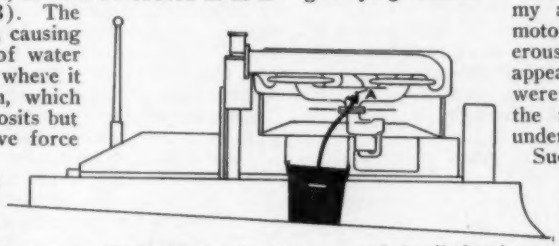
My second experiment was made from an old acetylene generator, as shown in Fig. 2.

In the cover I soldered a length of ¼-inch brass pipe (B) which, with a cap on its bottom end, reached almost to the bottom of the tank. In the end of the pipe, as illustrated, I drilled about twenty small holes about ⅛-inch diameter. To one side of this pipe I soldered a close nipple (E) and this I connected as near as possible to the intake manifold at A by means of fittings and a length of 5/16-inch copper tubing.

The cover should be air-tight, so that air sucked in at E must come in through pipe (B). The air bubbles through the water, causing moisture and small particles of water to be drawn into the cylinders where it changes to superheated steam, which not only drives out carbon deposits but also imparts a greater explosive force to the pistons.

This device not only kept out carbon, but increased the revolutions and effected a surprising saving in gasoline, and certainly repaid me for the trouble of making and installing it.

This device can also be made from galvanized iron in the form of a tank about 9 inches long and 5 inches diameter, as shown in Fig. 3. After the tube B and connection E are soldered into place, the cover should be soldered on, to make the tank air-tight. The tube B can be used to fill the tank.



E. J. S.—Ten minutes time once a week is all that is required to wash out the carbon by this method

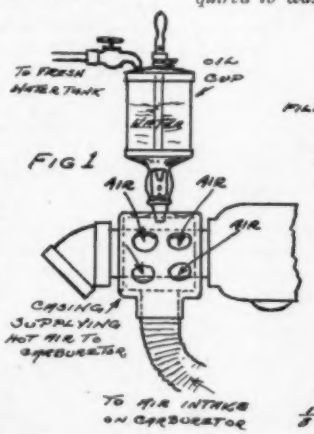


FIG 1

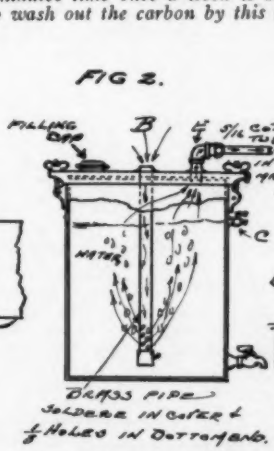


FIG 2.

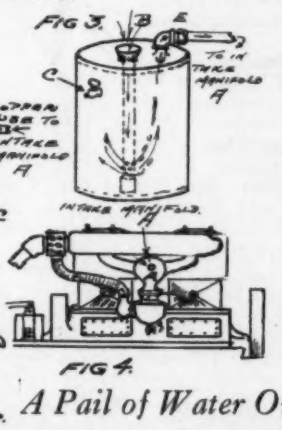


FIG 3.

INJECTING WATER INTO THE CYLINDERS

J. H.—The oil cup method may appear intricate but upon close examination it is in reality extremely simple

Care should be taken not to get too much water into the tank, as the suction will not be great enough to draw the air through teh water. The proper amount of water can be determined by gradually filling the tank until the bubbling stops. A small cock (C) soldered into the tank about ½-inch below the water level at which the bubbling ceases can be used as a gage to keep the water at a proper level.

These devices will prevent carbon and keep the cylinders clean, but they cannot be expected to cure an engine that is already choked with carbon. These devices, together with the use of the best cylinder oil and gasoline obtainable, will improve the action of almost any motor, increase its power and save fuel.

J. H., N. Y. C.

Discovered by Accident

I BLUNDERED upon a way to remove carbon from cylinders of my motor while trying to remedy another trouble. It is a trick with water well worth while and is not expensive. Most anybody mechanically inclined can make the device himself with odds and ends kicking around the house.

My motor is an old-fashioned four-cycle machine that developed 16 h.p. at 350 r.p.m. I was bothered by gasoline condensing in the manifold under the inlet valve of the after cylinder—a puddle collecting there to the detriment of the mixture. The forward cylinder got it right, but the other didn't have the pep like in the good, old days of the '76 stuff.

I proceeded to drain the puddle by drilling the manifold immediately under the inlet valve and tapping for a ¼-inch nipple to which I made a ¼-inch gate valve, short nipple and one-branch T, there being a 45 elbow between the short nipple and valve so the device would be horizontal and easier of access. No change was made in the auxiliary air intake of the carbureter and the needle valve was not touched.

After starting as usual I gradually opened the valve in the manifold, admitting additional air that vaporized most of the gasoline in the pool—the motor speeding up in a gratifying manner. I then opened the valve wide and, to my astonishment, the speed of the motor further improved with the generous admission of air. More oyxgen appeared to be what the pair of lungs were craving, having been stifled with the miserable dope I was feeding under the name of gasoline.

Suction of the motor was very marked through the manifold valve, and I was dumbfounded one day to perceive a puddle of water that had collected in the cockpit, being picked up and transferred to the motor. It made me think of the way waterspouts form by sucking the ocean up to the clouds. There was no diminution in speed of the motor, as the water was digested; but the medicine went through its internal economy like a dose of (*Cont. on pg.* 84)

FIG 4.

A Pail of Water Once a Month

A FOUR-CYCLE, four-cylinder motor of 3¾ inch bore has been kept free from carbon during the last season by the following method:

Tapped into the inlet manifold at the point "A" as indicated on the drawing is a ⅛-inch standard type petcock. This and about three feet of rubber hose together with a water pail are all the equipment required.

The method of operation was as follows: One end of the hose was slipped over the petcock and the other end dropped into a pail of water after first having been fitted with a brass plug which was drilled with a number 50 drill. The motor was run for a short time with a retarded spark, so as to heat it up in good shape, and when thoroughly heated the petcock, which up to this time had been closed, was opened.

The suction created in the manifold will draw the water up through the tube into the manifold and then on into the cylinders with the incoming gas. Care must be taken to use a tube with a heavy enough wall to prevent its collapse under the suction. If the motor slows down to the point

(*Continued on page* 84)

My Ideal Auxiliary

No. 2—Carina III—A 30-Foot Yawl

By F. M. Trapnell

The "My Ideal Auxiliary" Competition is open to every amateur of the country. There are no other restrictions and no limit to the size or type of the auxiliary which the designer may choose as his "Ideal". Designs may be submitted any time up to May 15, 1919, but the earlier they are received, the better chance the designer has to have them published. The plans should be complete and include outboard profile, arrangement plans, sections, construction, details, lines, and a table of offsets. A description of not over 2,500 words should accompany the plans.

For each design published we will pay $35 and to the winner of the series will be presented $65 worth of boat merchandise of the winner's choosing.

THERE are many men, myself included, who believe that there is no sport in existence to equal sailing. Certainly I know of nothing more exhilarating than a long reach out to sea on a clear day with a good stiff breeze and sea enough to make things lively. Were it not for the uncertainty of winds sailing would be the ideal sport. But this uncertainty is now overcome by the gasoline motor. Although slow to become converted to the auxiliary, I now realize the comfort and handiness of having a reliable little engine located out of the way but ready to kick you back to port when the wind fails. The advantages to be gained are far in excess of the slight loss in sailing qualities.

To my mind, an ideal auxiliary is one which a man may easily handle alone, and which at the same time will provide comfortable accommodations for one or two companions when cruising; and, most important of all, she should be a thorough sea boat.

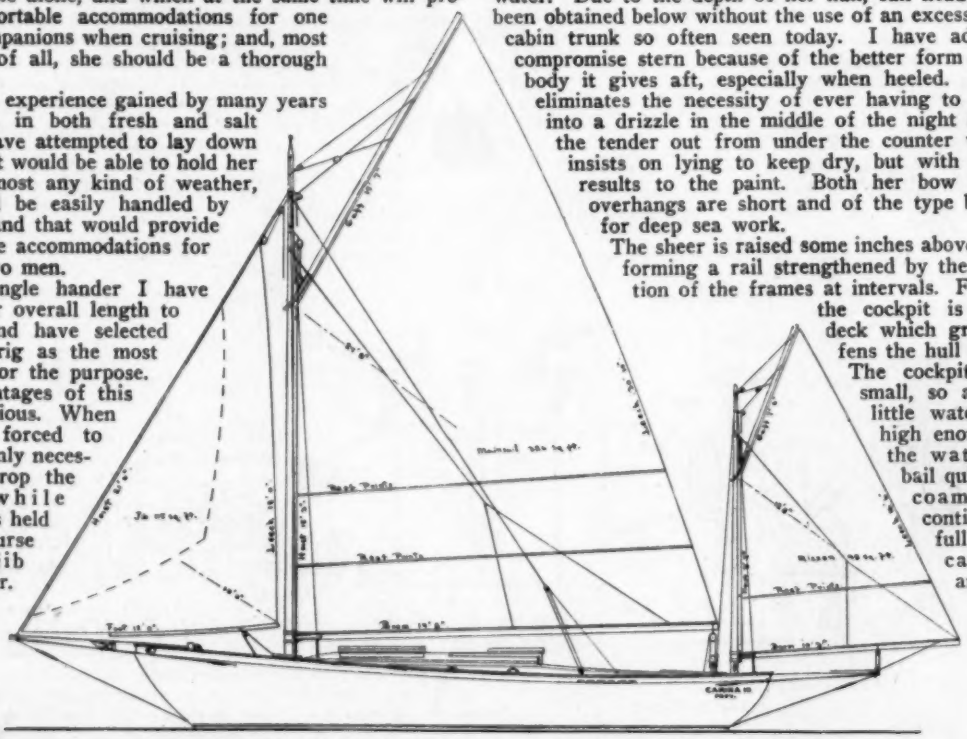
Through experience gained by many years of sailing, in both fresh and salt water, I have attempted to lay down a craft that would be able to hold her own in almost any kind of weather, that would be easily handled by one man, and that would provide comfortable accommodations for at least two men.

As a single hander I have limited her overall length to 30 feet and have selected the yawl rig as the most practical for the purpose. The advantages of this rig are obvious. When you are forced to reef it is only necessary to drop the mainsail while the boat is held on her course under jib and jigger. The job is made much easier by the fact that the entire sail is well inboard. Owing to the division of her canvas her sails are light and easily handled. The more popular sloop rig has none of these advantages, although it is somewhat better in going to windward and may be slightly faster on all points of sailing, which compensates somewhat.

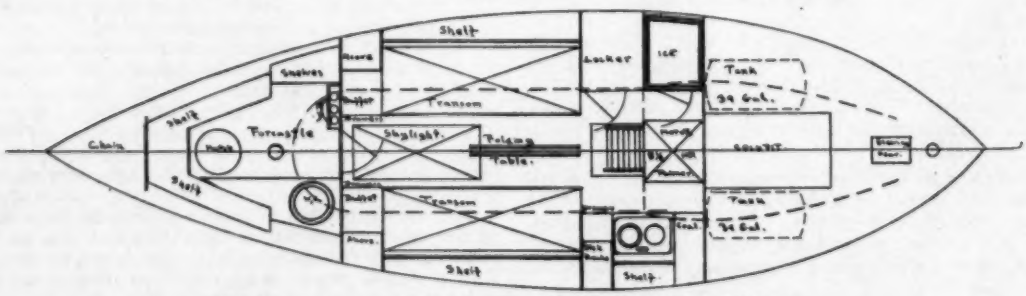
In a boat to be used for outside work freeboard and plenty of it is of the utmost importance. It not only allows for a larger heeling angle, which is a tremendous advantage in a sea way, and makes her drier, but it greatly increases the room below.

In the plans shown it will be seen that there is plenty of freeboard, especially forward, and amidships it is slightly tumble home, tending to keep her decks clear of water. Due to the depth of her hull, full head room has been obtained below without the use of an excessively high cabin trunk so often seen today. I have adopted the compromise stern because of the better form of underbody it gives aft, especially when heeled. This also eliminates the necessity of ever having to crawl out into a drizzle in the middle of the night and shove the tender out from under the counter where she insists on lying to keep dry, but with disastrous results to the paint. Both her bow and stern overhangs are short and of the type best suited for deep sea work.

The sheer is raised some inches above the deck, forming a rail strengthened by the continuation of the frames at intervals. Forward of the cockpit is a bridge deck which greatly stiffens the hull amidships. The cockpit itself is small, so as to hold little water, and is high enough above the waterline to bail quickly. The coamings are continued from full height of cabin trunk and are lo-



Outboard profile and sail plan of Carina III. Scale 3/16 inch equals 1 foot



Interior arrangement plan showing the possibilities in a 30-footer

cated so as to provide ample seating space. The cabin trunk is small, thus allowing spacious decks, and forward over the forecastle there is a circular hatch.

She may steer with a tiller or a wheel, according to the ideas of her owner. Personally for a cruising boat I prefer a wheel.

In laying out her interior an attempt has been made to provide as simple and practical an arrangement as possible, so as to give good ventilation and ease in cleaning. The first consideration was to place the motor in a position where it would be easily accessible and at the same time out of the way as much as possible. The logical place was under the bridge deck and back of the companionway, which is arranged to be easily moved. On each side of the cockpit there are tanks of thirty-nine gallons each for gasoline and water. If the owner intends to make long cruises an additional tank can be easily installed under the cockpit.

The after part of the cabin forms the galley, with a stove on one side and a large ice-box on the other. There is also a coal locker, dish racks, stand, and locker under. Opposite, on the starboard side, is a large, full-height locker for clothes, etc. Forward of this are two built-in berths, back of which are shelves. There is a small folding table and over the main part of the standing room is a 4-foot skylight, providing increased light, ventilation, and headroom. A door leads into the toilet room and forecastle, in which are shelves and chain locker. The interior finish is in white enamel, which is easily cleaned and makes a much brighter cabin than mahogany or any other dark finish.

From personal experience I have selected a 5½ h.p. Model T 1 Palmer motor with make and break ignition, for salt water, turning a 20-inch three-bladed propeller at 450 r.p.m. With this power she should make better than 5 m.p.h.

Her lines show a long, easy entrance, which should make her a comfortable craft to drive into a heavy sea. Her bilges are pronounced enough to give her considerable initial stability, which is necessary for offshore work. The narrow, deep type of boat does well to windward, but is wet and rolls excessively, making all work on deck difficult and dangerous. Her keel is long and straight, tending to hold her on her course and thus allowing the wheel to be left alone for a time. It also reduces the tendency to yaw in running off. She will carry about 5,000 pounds of lead on her keel, the remainder to be carried inside.

The standing rigging is steel, set up with turnbuckles. There are four shrouds on both main and mizzen mast and the main is fitted with running backstays. The halyards are belayed to a pin-rail at the foot of the mast.

It will be noticed that the jigger amounts to more than that seen in most yawls where its driving power is negligible. All spars are heavy enough to prevent buckling, thus insuring the proper set of the sails at all times.

The bowsprit is flat on top and the inner end houses in the riding bits which extend through to the keel.

Her total sail area is 539 square feet; 115 in the jib, 326 in mainsail, and 98 in the mizzen.

Herchief dimensions are: Overall length 30 feet, extreme beam 9 feet 3 inches, draft 5 feet 3 inches.

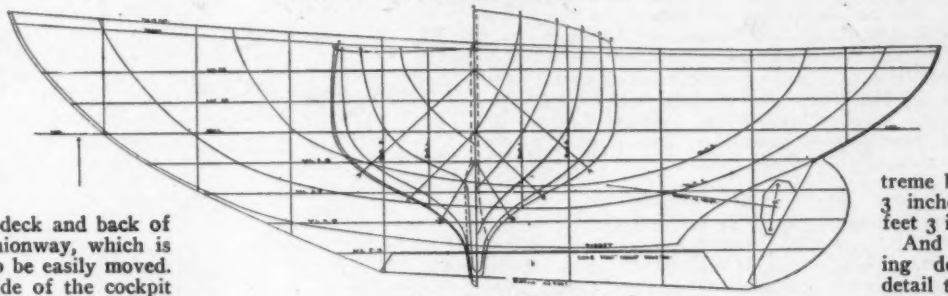
And now, having described in detail the hull and its equipment, a word about the masts and sails. The mainmast has a hoist of 15 feet, 3 inches and the mizzen mast 8 feet, 2 inches. The gaff of the mainmast is 15 feet, 7 inches and the mizzen gaff 7 feet, 6 inches. The hoist of the jib is 21 feet, 6 inches and the leech an even 18 feet. The foot of the jib is 12 feet, the boom of the mainmast 14 feet, 8 inches and the boom of the mizzen 10 feet, 3 inches. The jib measures 115 square feet, the mainsail 326 square feet, and the mizzen 90 square feet. In order to secure the large surface necessary for the mainsail the leech must be 30 feet, 10 inches. In order to give her stability I would provide a keel of at least 5,000 pounds of lead.

While yawl rig for so small a craft does not tend to make her in appearance the most beautiful boat in the world, yet in her own class, as an auxiliary, she would compare more than favorably with many similar craft and withal she would embody certain features that many designers have neglected to install or at least have devoted so little thought to that their elimination has been oftimes suggested as a matter of course by the boat builders. There is no doubt in my mind as to her staunchness and seaworthiness and with bare sticks and her motor in good shape she could run before the heavy gales of the Atlantic coast and the Great Lakes and weather them like an ancient mariner.

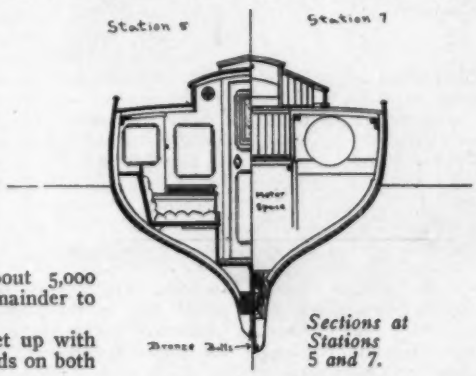
I would like to give some figures on the approximate cost of constructing an auxiliary of this type but upon investigation find that materials vary so much in price in various localities that it is impossible to give even that sort of an estimate. On the whole, though, the boat should be comparatively inexpensive.

Dimensions in feet—inches and eighths.	TABLE OF OFFSETS FOR 30 FOOT AUXILIARY YAWL.										Dimensions to outside of planking.
	STATIONS	0	1	2	3	4	5	6	7	8	9	S
HALF BREADTHS.	Sheer		1-6.0	2-8-3	3-5-7	4-1-1	4-5-0	4-6-1	4-3-3	3-7-7	2-4-4	
	WL 3 A		1-1-0	2-5-5	3-3-3	4-1-4	4-6-2	4-7-1	4-3-3	3-7-1	2-3-0	
	WL 2 A		0-7-4	2-1-0	3-3-3	4-1-2	4-6-7	4-7-6	4-3-0	3-4-1	1-7-6	
	LWL		0-0-0	1-6-5	2-11-1	3-11-4	4-5-7	4-7-1	4-1-3	2-10-3	0 7-2	
	WL 2 B			0-4-7	2-2-2	3-3-6	3-10-6	4-0-3	3-4-6	1-7-6		
	WL 3 B				1-0-5	2-0-0	2-4-6	2-6-4	1-3-7	0-3-2		
	WL 4 B				0-2-6	0-6-1	0-10-4	0-11-2	0-7-1	0-2-5		
	WL 5 B					0-2-4	0-3-6	0-4-2	0-2-2	0-2-0		
HEIGHTS ABOVE BASE LINE.	Raised Sheer	10-0-7	9-9-6	9-6-6	9-3-5	9-1-1	8-10-6	8-9-0	8-7-4	8-7-0	8-7-2	8-7-4
	Sheer		9-5-6	9-3-0	9-0-2	8-9-7	8-8-2	8-8-6	8-6-6	8-5-0	8-6-1	
	Rabbet		6-2-4	4-3-1	3-1-2	2-7-1	2-3-1	2-1-6	2-0-2	4-1-3	5-4-3	
	Stem		6-0-7	4-1-6	2-8-3						5-8-6	
	Keel					1-5-0	1-2-6	1-0-3	0-10-2	0-9-0		
DIAGONALS	A		1-4-0	2-4-6	3-7-0	4-3-5	4-10-2	4-11-2	4-6-1	3-5-4	1-10-6	
	C			1-3-0	2-2-3	2-9-6	3-0-1	3-0-6	2-7-7	1-3-0	0-4-1	
	B			0-7-6	1-6-0	1-11-6	2-1-4	2-1-7	1-10-1	0-9-1		
	Stations spaced 2 feet.					Water line planes spaced 1 foot.						

Table of offsets for building Carina III.



Lines of the 30-foot yawl



Sections at Stations 5 and 7.

War Service Record of American Yachtsmen and Motor Boatmen

A Brief Resume of the Service Seen by Many Officers and Men Who Received Their First Love of the Water Aboard Small Motor Boats in Peace Times

(*Continued from the February issue of* MoToR BoatinG)

Lieut. George Gardner Fry

SEVERELY injured in the line of duty, George Gardner Fry, Lieutenant, junior grade, U.S.N.R.F., had the misfortune to lose the command of the Sectional Patrol Idalis No. 270 in November, 1917. Since which time he has been Court, Ordnance, and Enrolling Officer, and Senior Member of the Court Martial at Section Base Six of the Third Naval District, with headquarters at Bensonhurst, N. Y.

Mr. Fry was enrolled with the rating of Lieutenant, junior grade, because of his skill in handling sea craft. It was he who won the championship of the Yacht Racing Association of Long Island Sound six times, and in 1908 won the International Dory Race, held at Amsterdam, Holland, in August of that year. He was made a member of the Royal de Hoop Yacht Club of Amsterdam. He has also been a member of the Horseshoe Harbor, Seawanhaka, Corinthian, Orienta, and American Yacht Clubs. At the time of his accident he had been in command of Idalis since June, 1917, and was only relieved when it was necessary to send him to the Naval Hospital in Brooklyn. Two operations were performed and he was discharged, completely cured, in the latter part of December. Then it was that his assignment to Section Base Six came.

Lieut. Howard Brooks Converse

DUE to his previous training in the preliminary summer cruise of 1916, Howard Brooks Converse, of Newton, Mass., was rated as Ensign immediately upon joining the Naval service in the beginning of the war. Ensign Converse had always taken an interest in the Navy and when the war came felt that he could not get into the fray quick enough. He was assigned to duty first on the cruiser Charleston and later was temporarily transferred to U. S. S. New York.

From New York he was sent to U. S. S. Wyoming, where he was permanently assigned and remained there as part of its officer personnel during the balance of the war. While aboard Wyoming he took his examinations for promotion to Lieutenant, junior grade, and was promoted to that rating in June, 1918.

Henry St. L. Farnsworth

HARD luck seemed to follow Henry St. L. Farnsworth, of Sausalito, Calif., who was unable to get to sea and was forced to make the best of it, although he tried time after time for a chance to sail on the element he loves.

Enlisting in the naval service in May, 1918, he was assigned to three training stations. From the last of these, the Mare Island Training Station, he was finally ordered to a destroyer then in the course of construction at the Union Iron Works and later was placed on detached duty to assist in putting the ship into commission. Incidentally, this duty brought him near home and there he expected to remain until the vesselt went to sea. Mr. Farnsworth was much disheartened by his experience in the Navy, where he did all of his duty on land.

Quartermaster William Lawton Cross

TO "listen" was the peculiar duty of William Lawton Cross, Quartermaster, first class, of Barrington, R. I., who enlisted in the Naval Reserve Force in December, 1917. At the time of his enrolment young Cross was given the rating of coxswain because of his skill with power boats. He was sent to the Listening School at New London, Conn., and was then rated Quartermaster, first class.

In April, 1918, he was assigned to Submarine Chaser No. 36 as Listener, and on this tiny craft made the trip across the wide Atlantic Ocean. It was necessary for the little boat to make stops at Bermuda and in the Azores in order to replenish her fuel and provision supplies and to secure fresh water, but she made the trip safely, and after spending a short time in Brest, France, repairing and tuning up was sent to Plymouth, England, where she was based. Most of the summer Quartermaster Cross spent in patrolling the English Channel off Land's End and the Scilly Islands. During this time his craft had several encounters with submarines.

Lieut. James C. White

LEAVING Harvard the day war was declared to enter the Naval service, James C. White, Lieutenant, junior grade, gave conclusive evidence of his ardent patriotism. When the news came of the declaration of a state of war with Germany this Bostonian, who resided with his father, Dr. Charles J. White, immediately went to the first recruiting office and enlisted.

He was first rated as Ensign in the Reserve and was assigned to duty at the Charlestown Navy Yard until the early part of May. Then he was transferred to the scout cruiser Birmingham and in June went overseas as convoy to General Pershing's first troops. In July the cruiser returned to New York, but he sailed again in the early part of August and this time went to Gibraltar. Here Birmingham, as the flagship of Admiral Wilson, who cammanded the American fleet based at that fortress, was stationed for many months. In November, 1917, he took his examination for promotion to lieutenant, junior grade, and in September, 1918, the promotion came through.

Gunner's Mate Frank S. Ayres, Jr.

ELEVEN round trips across the Atlantic Ocean, through the war zone, with five submarine attacks on one of those trips, is the record of Frank S. Ayres, Jr., of Bridgeport, Conn.

Young Ayres, who is a gunner's mate, enlisted May 3, 1917, and shipped on the cruiser North Carolina, May 12. Here he remained in training, along with other lads who had enlisted about the same time, and on October 16 he had made such decided progress that he was ordered into the transport service on U. S. S. Kroonland. It was while he was on Kroonland that he made the numerous trips across.

He served as a seaman of the armed guard of that vessel until February 18, 1918, when he was promoted to gunner's mate. Nine of his trips were to France and two were to Liverpool. On one of these trips he had a close call when the British ship Ardenia was torpedoed while just a half mile ahead of Kroonland. This was in the Irish Sea. It was during June that the five fights with U-boats occurred and since that time Gunner's Mate Ayres had another exciting experience when in December his vessel battled through a big Atlantic storm that carried away three life boats and six life rafts from the boat deck of Kroonland. During this gale six depth charges broke loose and the whole ship was in imminent danger of being blown into smithereens until they had been secured again.

Lieut. John Black, Jr.

FROM the staid and quiet precincts of a Boston schoolhouse to the stirring violence of war in Mediterranean waters is a far cry, but Lieutenant John Black, Jr., son of Mr. and Mrs. John Black, of Dorchester, Mass., was among those fortunate enough to write history in those troubled seas. This Boston yachtsman, for Lieutenant Black had been making his home there, enlisted in the Navy in April, 1917. He was sent to Marblehead with one of the first units and later transferred to the Bumpkin Island training station and finally to the Naval Academy at Annapolis.

In June, 1917, he graduated as an Ensign of the Reserve and was ordered to duty on the U. S. S. Seattle, on which vessel he made five trips across the Atlantic in the space of nine months. In June, 1918, he was transferred from the convoy service to patrol duty in the Mediterranean, and July 26 promoted to Lieutenant, junior grade. Before enlisting he was in charge of the manual training in the Osgood School in Boston.

(*Continued on page* 32)

More Yachtsmen Who Made Good in the Navy

Ensign C. Willard Evans, Chairman California Section American Power Boat Association

Lieut. John Hatch Blood, commanding officer Kwasind

Edgar T. Wareing, of Albany, who made the supreme sacrifice

Dr. Raynham Townshend who had seven years service in the Naval Militia previous to the war

Arthur Larsen, who has been engaged in experiments with anti-submarine devices

Samuel H. Brown, Jr., a former N. N. V., of Massachusetts

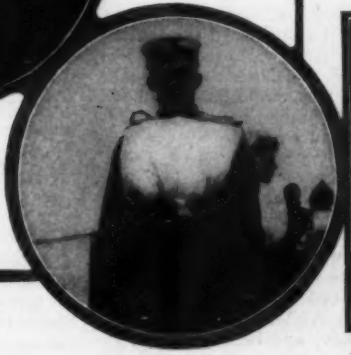
Ensign Benjamin Acker

H. O. McLean

Chief Machinist Mate, Harold J. Gahn, U. S. N. R. F.

Assistant Surgeon T. Raymond Healy one of the Navy's X-ray experts

Guy A. Sullivan, a member of the Chelsea Boat Club, one of those who trained at Newport



Ensign G. J. Breaznell in the war zone May 25, 1918

Machinists Mate James W. Ott, has been on mine sweeping duty at the Staten Island Base

War Service Record of American Yachtsmen and Motor Boatmen

(*Continued from page 30*)

Quartermaster D. S. Wood

DURBIN S. WOOD, a member of the Shattemuc Yacht and Canoe Club of Ossining, was among the first of that popular organization's members to volunteer for the Naval Reserve Force after this country declared war against Germany. Enlisting in New York, he was later stationed at Morris Hights, and because of his good work and strict attention to duty was finally advanced to Chief Quartermaster.

Chief Yeoman W. G. Wood

AMONG those patriotic members of the Shattemuc Yacht and Canoe Club of Ossining, N. Y., who volunteered for the Naval Reserve Force at the beginning of the war, was Chief Yeoman William G. Wood who was for a time stationed at Morris Heights. Later he was transferred to Pelham Bay where he remained during the entire period of the war until he was finally transferred into the Reserve.

Ensign H. N. Wilcox

PATROLLING off the American coast on Sectional Patrol boats has been the bulk of the service of Ensign Howard N. Wilcox, of the Shattemuc Yacht and Canoe Club of Ossining. Ensign Wilcox volunteered his services at the outbreak of the war in the Naval Reserve Force and after a short period of training received his commission. He has had duty on board U. S. S. Calumet most of the time.

Lieut. A. R. Genet

VOLUNTEERING his services with his State organization, the Eighth Battalion of the State Naval Forces of New York, Lieutenant A. Rivers Genet, of the Shattemuc Yacht and Canoe Club of Ossining, saw much active service and acquitted himself so creditably that he was promoted from ensign, his rank at the time he volunteered, to lieutenant. At the time the armistice was signed he was attached to the Officers Training School in Boston as an instructor.

Lieut. A. O. Squire

UNABLE to get across, Lieutenant Amos O. Squire, of the National Naval Volunteers, had to make the best of it and served his country during the war as officer in charge of the State property at Ossining, N. Y. Dr. Squire was a member of the Eighth Naval Reserve Battalion and held the rank of lieutenant in it. He is also fleet surgeon of the Shattemuc Yacht Club of Ossining.

Ensign B. A. Acker

RELINQUISHING his business interests in order that the Government might use his services on the high seas, Ensign Benjamin A. Acker joined the Naval Reserve Force at the outbreak of the war. He was commissioned almost from the begining as assistant paymaster with rank of ensign and has seen considerable active service.

Herman Cox

ALMOST a month before the United States entered the war, or to be exact, May 14, 1917, Herman Cox, of the Orienta Yacht Club, entered the Naval Reserve Force. He was called into active service June 6, 1917, and from the time until October 26 was attending the Bridgeport Training School. Then he was sent to the Naval Radio Station at Belmar, N. J. He also saw service on Sectional Patrol No. 172.

Boatswain's Mate C. H. Cotton

DUTY on Sectional Patrol boats fell to the lot of C. Howard Cotton, well-known member of the Shattemuc Yacht and Canoe Club of Ossining, who enlisted in the Naval Reserve Force in the early part of the war. He was not called until September, 1917, when he was ordered to duty on patrol boats operating in the waters around Whitestone. This bright young chap had made good in the Navy and been promoted to Boatswain's Mate, first class, when he was so unfortunate as to contract Spanish Influenza from which he died after a short illness.

Electrician H. F. Felch

ENTERING the Merchant Marine as wireless operator on Acushnet, later a Sectional Patrol boat, November 19, 1916, Chief Electrician Harry Franklin Felch, son of Mr. Frank P. Felch and Mrs. Hattie Felch, of Lowell, Mass., was on patrol duty until December 6, 1917. He was then sent to the Training School at Newport as Radio Instructor and remained there for the balance of the war.

He learned wireless by building a station of his own at home when twelve years old. He followed this up by forming a club of amateurs, which he maintained until he was twenty years old, when he took a short course in a Boston school and directly afterward passed an examination for the Merchant Marine service.

Ensign G. W. Young

AMONG those who made the great sacrifice was Ensign George W. Young, Jr., son of Commodore George W. Young, of the Harlem Yacht Club. Ensign Young died in the Royal Naval Hospital at Corfu, Greece, November 23, 1918. From his letters to his father Ensign Young must have had some remarkable experiences, as he was one of those officers who made the trip all the way from the United States to Corfu on a Sectional Patrol boat under its own propulsion. He was in command of Patrol No. 81. He was a member of the Harlem Yacht Club and employed by the B. F. Goodrich Rubber Company when the war broke out.

R. S. Hendrie

FROM May, 1917, when he enlisted in the Naval Reserve Force, until the armistice was signed, R. S. Hendrie, of the Gloucester Yacht Club and the Squantum Yacht Club, had been engaged in duty on Sectional Patrol boats off the American coast. His boats were under the direction of the commandant of the Second Naval District, and Mr. Hendrie was among those unfortunates who did not get overseas.

Ensign A. J. McElhinny

GIVING up a lucrative law practice at the outbreak of the war to enlist in the Naval Reserve Force, Andrew J. McElhinny, a member of the New York Motor Boat Club, was first stationed at the Brooklyn Navy Yard for a few months. Later he was sent to Annapolis for intensive study and training. Upon completing this course he was commissioned an Ensign in the Regular Navy and assigned to the battleship North Dakota. Not content with the inactivity of the big ships, he took a course in a submarine school in Boston, at the expiration of which he sailed for Brest. Arriving there he was assigned to Wanderer, doing patrol duty off the French coast.

In view of his previous legal training he was recently transferred to St. Nazaire, France, where he is at present acting in the capacity of special attorney for the United States Government on Admiralty cases.

Corporal W. D. Sherman

THE Marine Corps attracted Corporal W. D. Sherman, who enlisted in July 1917 and trained at Paris Island, S. C. He passed as an expert rifleman and was detailed as an instructor at Quantico, Va. He sailed for France with the Eighteenth Company, Fifth Regiment, of Marines on December 7, 1917, and has been overseas ever since. He was wounded July 11, 1918, by a machine gun bullet in the left leg, but had sufficiently recovered to be back in action on October 15, with his same company and regiment. He has been promoted to corporal and is still in the service.

Lieut. N. Gill

BEING already the first assistant engineer aboard S. S. Kroonland before the war, Lieutenant Napoleon Gill, of the Pequonnock Yacht Club, enlisted in the Navy early in the conflict. He was assigned to his own ship when the United States took her over and spent some months in the transport service. He was commissioned as a lieutenant and had a number of exciting experiences. Presently he is stationed at Stamford, Conn., inspecting the construction of mine sweepers and the installation of machinery in these vessels.

War Service Record of American Yachtsmen and Motor Boatmen

Electrician Thomas Wilson

TRAINING at Newport and Portsmouth, N. H., after enlisting in the Navy early in the war, Electrician Thomas Wilson, of the Pequonnock Yacht Club, was then assigned to U. S. S. Texas, spending nine months in European waters on this warship. He had the good fortune to be present at the surrender of the German fleet. He saw King George, when the British monarch visited U. S. S. New York, and he was on Texas when that warship was part of the fleet convoying President Wilson's vessel, George Washington, into Brest. He had an opportunity to see something of European ports, visiting London, Brest, Edinburgh and several other cities in England and Scotland. He expects to finish out his enlistment, which expires in 1920.

Machinist's Mate Harry Gutmann

TYPICAL of the spirit that actuated Americans during the war, Harry Gutman, an active member of the Stuyvesant Yacht Club, one of the four sons of a widowed mother, joined the Navy as an apprentice seaman October 24, 1917. Mr. Gutman was the owner of the prize winning catboat Comet and a motor boat enthusiast. His yachting experience stood him in good stead, and when he was assigned to the League Island training station he was promoted to a machinist's mate, third class. A short time later he was advanced to machinist's mate, second class. He was sent to the transport Hancock, which has been continuously engaged in carrying troops and supplies abroad. In Hancock he made three trips to France, three to the Azores and three to Porto Rico and varied transport work in the war zone in the trans-shipment of troops and supplies, running the gauntlet of mines, U boats and enemy ships without the loss of a man.

During the period when the U-boats visited this coast Hancock was attacked by a submarine while bound from Porto Rico and nearing Newport News. The German fired a torpedo which passed between the bow of the transport and the stern of a convoying cruiser. Both cruiser and transport replied with gun fire and depth charges, and the submarine submerged.

Before Harry Gutman enlisted, his older brother, Julius, a Philippine veteran, had already joined, being regimental sergeant-major of the Seventeenth Infantry. Later his brother Emil enlisted in the Quartermaster corps, holding the rank of corpora, and the fourth brother was awaiting the call to arms when the armistice was signed.

Lieut D. L. Furness

BECAUSE of his electrical and engineering skill Douglas L. Furness, of Philadelphia, was appointed a lieutenant, junior grade, in the Naval Reserve Force, November 20, 1917, for electrical duties. He was sent to Annapolis from December 3 to January 9, and was then transferred to U. S. S. Virginia with the Atlantic Fleet. He remained aboard Virginia from January 19 to April 4, and then was assigned to the Machinery Division at the Philadelphia Navy Yard, remaining there until he was mustered out of the service, December 17, 1918. Lieutenant Furness was among those unlucky ones who did not get overseas service.

Ensign A. H. Galow

ENLISTING as a quartermaster, second class, August H. Galow, former secretary of the Ketewomoke Yacht Club and secretary of the Huntington Bay Division of the United States Power Squadron, Inc., is now an ensign in the Naval Reserve Force. Ensign Galow enlisted April 14, 1917, and was called into active service May 16, 1917. He served three months on Sectional Patrol No. 100, doing patrol duty at the Narrows and Ambrose Channel, and then was transferred to U.S.S. Goldshell for three months. This vessel, an oil tanker, while making a trip in foreign waters, was attacked and two other ships in the convoy sunk. Goldshell also had a running battle with a submarine, which ended in the U boat disappearing after about twenty shots had been fired.

Then came another three months on Sectional Patrol No. 323 off New London, when his rating was changed to quartermaster, first class, and he was sent to the Officers' Training School at Pelham Bay. Graduating here in three months, he was commissioned and assigned to duty at Section Base No. 2, Bridgeport, Conn. While there he served in the capacity of Instructor, Executive Officer and Commander of Squadron Six. On January 1, 1919, he was transferred to inactive duty. Ensign Galow believes that the experience gained from spending much of his time in yachting and motor boating helped him wonderfully in his work in the navy.

F. A. Fenger

HAVING just returned from sixteen and a half months in foreign service, Frederic A. Fenger, of Chestnut Hill, Mass., has had some exciting experiences. For a bit over fourteen months of that time he was attached to the scout cruiser Chester, doing ocean escort work from Gibraltar to England. For the first eight months he was aid to the navigator and for the balance of the time junior watch and division officer. In that time his vessel travelled some 45,000 miles, not including zig-zagging, and lost only one ship while they were in the convoy.

That occurred one morning about 10 o'clock, when the ship was attacked on the opposite side of the convoy about 4,000 yards away. Two British destroyers who were with the convoy dropped depth charges, but failed to get the sub. In November, 1917, Chester sighted an enemy U-boat on the horizon, but she was submerging at the time and got away. Last August they made contact one morning at 1:15 o'clock with a submersible, which they later learned was U-53. She fired a torpedo but missed. Chester nearly rammed her, hitting her with the port paravane and dropped four depth charges on or near, but she subsequently returned to port.

Aside from that it was a deadly monotony of coaling ship, field day, going to sea for a week or ten days and then doing the same thing over again. His last two months were spent on the other side on Prometheus at Brest, a mother ship for destroyers and yachts, and here they did everything from pouring a 1,000 pound casting to making a new balance wheel for a wrist watch. Mr. Fenger has been on active duty since March 1917, and says that he is now hoping that the Navy Department will see fit to allow him to quietly ease back into civil life, long hours in bed and late breakfasts.

Lieut. Commander R. E. Tod

SAILING as navigating officer on the former yacht of J. P. Morgan, Corsair in the first troop convoy to leave for France, Lieutenant-Commander Robert E. Tod, has been on the other side ever since. For six months after his arrival Lieutenant-Commander Tod was at sea doing convoy and patrol duty of the Naval Base at Brest. Since then he has been Captain of the Port at Brest and at present is Director of Public Naval Work in France.

Lieut. J. L. Merrill

SERVICE in the war zone on one of the Destroyers was the good fortune of Lieutenant John Lee Merrill, son of Mrs. J. Warren Merrill, of Boston. Lieutenant Merrill joined the service in March, 1917, graduating from the first intensive course at Annapolis on September 15, 1917. He was ordered overseas to the war zone on U. S. S. Conyngham, operating with Queenstown as its base. This fleet was under Admiral Sims, with the British Admiral Sir Lewis Bayley in direct command. After eleven months' service here Lieutenant Merrill was ordered back to the United States to get a new Destroyer. At the time the armistice was signed he was attached to the Destroyer Meridith building at the Fore River Ship Yards. Since entering the service he has been promoted twice and is now a full lieutenant in the regular Navy.

His ship Conyngham held the second pace in the Destroyer records of miles steamed, having travelled 63,991 miles in the war zone. This young officer was in a thrilling rescue when a German submarine got inside of a convoy of twenty ships. Lieutenant Merrill always loved the sea, spending his summers at Manchester-by-the-Sea, where his family have had their summer home for over sixty years. He had always had a boat of his own since he was five or six years old and though he did some racing his boats were always selected by him for their practical use and comfort for cruising, which he preferred. His uncle, T. W. Merrill, owned the first fast racing cutter of English type to be sailed in American waters, but he, like his nephew, preferred cruising. When Lieutenant

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Merrill left Harvard in his Sophomore year to go to war he had expected to put his yacht Tarpon into commission to go cruising to Bermuda and instead did his cruising in the war zone.

Lieut. L. E. Doone

HELPING to lay the great mine barrier in the North Sea was the part that Lieutenant Lewis E. Doone played in the Great War. Enlisting in the beginning of the war he was first assigned to U. S. S. North Carolina and made several trips across on that warship doing convoy duty. Transferred later to the mine layer Canonicus he proceeded to the North Sea to engage in laying that great barrier and had been there since last June finishing the work just as the armistice was signed. This was extremely dangerous work as his little vessel at times carried more T. N. T. than destroyed the City of Halifax. Admiral Sims complimented the crew on the excellence of their work, which was a task that the most noted experts in the United States and the Allied countries believed for a long time could not be accomplished. Lieutenant Doone was promoted from the junior grade to a full lieutenancy a short time ago. He arrived back in the United States recently.

Lieut. A. V. Kidd

WHEN diplomatic relations were broken between the United States and Germany in February, 1917, Lieutenant Alfred Vinal Kidd, although married, immediately offered his services. Because of his practical knowledge of navigation and thorough familiarity with the coast, the result of years of yachting experience, and unconscious preparation for the emergency then facing the country, he was advised to take examination for an Ensign's commission in the Naval Reserve Force.

He passed successfully and was commissioned March 22, 1917. On the outbreak of hostilities he was called into active service and April 12 was assigned to duty at the First Naval District Training Station at Marblehead, Mass. Five days later he was appointed a staff officer and aide to Captain James Otis Porter, in which capacity he served for three months. The following six months he was in command of U. S. S. Talofa, with Boston as his first base and later Portland, Maine, and in December he was made Executive Officer and second in command of the Naval Base at Portland.

In recognition of the work he had done during his first nine months of service Ensign Kidd was recommended for a Lieutenancy (junior grade) by his commanding officer in the First Naval District and received the promotion in February, 1918. April 13 he was transferred to the Training Station at Rockland, Maine, and appointed section commander of the naval base there. He is the son of Mr. and Mrs. A. Lawrence Kidd of Savin Hill and was born November 15, 1886.

Ensign F. S. Peterson

ASSIGNED to duty at the United States Naval Air Station at San Diego, Cal., Ensign F. Somers Peterson, has been unable to get across, which has been a great disappointment to him. Ensign Peterson was sent to the San Diego station in December, 1917, as Transportation and Building and Grounds Officer, and due to the fact that it was a new station and has been built up from the ground the Navy Department found his services too valuable there to move him. The other officers there have been also held. Ensign Peterson is a member of the San Francisco Yacht Club.

Frederic Blow

IT was on Easter Sunday morning of last year that Frederic Blow realized for the first time that this country was at war. Aboard the British oil tanker Cungban, which had left New York March 8, his vessel was well at sea when he witnessed the collision between the oil tanker O. B. Jennings and War Knight. This occurred just before daybreak and when Jennings exploded and caught fire when she was struck the sea was illuminated for miles around. However, after the convoy was brought back into order again everything went smooth and he landed in England April 6. Mr. Blow pays high tribute to the American Consuls in England and France where there were no naval bases, saying they took keen interest and excellent care of the American seamen.

Later he was transferred to Muscatine, a refrigerator vessel carrying beef for the Government and he has already made two trips across in her. On the first trip they were 200 miles from New York when a submarine raided their convoy but did not damage the convoy. The U-boat fired several shots at a ship that fell behind but missed.

Boatswain George Harr

AS Executive Officer on Sectional Patrol No. 666, George Harr, of Brooklyn, a member of the Gravesend Bay Yacht Club has been given his share of active service. Enrolling in the Naval Reserve Force as a Quartermaster, first class, he was first assigned to a guard ship, and later sent to Pelham Bay for instruction. From Pelham he was sent to Patrol No. 666 and promoted to Boatswain.

Ensign John K. Birch

ENROLLING in the Naval Reserve Force as a Quartermaster, first class, John Kenneth Birch, of Brooklyn, of the Gravesend Bay Yacht Club, was called into active service April 9, 1917, and assigned to patrol duty. After a short time on the Scout Patrols he was given the examination for Chief Petty Officers and promoted to Chief Quartermaster. Later he was detached from the patrol boat and ordered to the officers' training school at Pelham Bay, and when he had finished that course he was recommended for an Ensign's commission.

Ensign J. G. Breaznell

ENSIGN Joseph G. Breaznell, of Brooklyn, a member of the Gravesend Bay Yacht Club, enrolled in the Naval Reserve Force and after being in service some time was promoted to Ensign and attached to the Cruiser Galveston, which is presently docked for overhauling.

Captain Clarence Ball

AMONG the men who helped make the Marines more famous in France than they ever were before, was Captain Clarence Ball, former Fleet Captain of the Genesee Dinghy Club of Rochester and Commodore of that Club in 1913. A veteran of the Spanish-American War, serving through that struggle as a Quartermaster on a collier, Captain Ball conceived the ideas of organizing a company of Marines for service in the World War and offering them to the Government. His men were accepted and he was commissioned a second lieutenant. The company was ordered to the Brooklyn Navy Yard, where it did guard duty for some time.

Finally the command was shipped to France and distinguished itself in the fighting, Second Lieutenant Ball being promoted to a First Lieutenancy and later to a Captaincy, and was still in France with his men late in January.

Frank M. Schultz

SERVING continuously in the Naval Militia of New York from July 23, 1903, until the outbreak of the war Chief Master-at-Arms Frank M. Schultz, of the Genesee Dinghy Club of Rochester was sent to Philadelphia at the first sign of the opening of hostilities. There he remained at the Navy Yard until assigned to the Battleship Wisconsin and was later transferred to the Cruiser Salem. Finally he was ordered to U. S. S. Iowa and left Philadelphia on that warship for patrol duty. Iowa joined the battle force May 30, 1918, and was attached to that fleet until the close of the war.

Chief Yeoman G. E. Baumeister

EIGHTEEN months on the transport Powhattan Chief Yeoman George E. Baumeister made his last safe return the middle of January, his vessel carrying a load of Heavy Artillerymen from Nebraska and about 300 wounded. C. P. O. Baumeister enlisted in the Naval Reserve Force in May, 1917, as a Yeoman, first class. He has poughed the waves to France eight times on Powhattan which had her submarine scares with the rest. The first trip came near proving disastrous, for on the way back the ship was caught in a terrible storm and the main tiller broke. Powhattan drifted until it was secured, and steering with her engines made Brest after three days of furious battling with the elements.

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The destroyers escorting the ship were lost in the storm and the liner was not convoyed for five days, all of that time in the war zone. Chief Baumeister is strong for the American girls, saying they have the French madamoiselles beaten in every way.

Lieut. Caleb Soring

ENLISTING in the Navy in April, 1917, Caleb Soring was assigned to duty almost immediately. A three months' course in the Officers' Training School at Annapolis followed and he was then commissioned Ensign and assigned to the Battleship Florida where he remained until after the signing of the armistice. One year after joining the service he was promoted to Lieutenant, junior grade. Lieutenant Soring's duties have been in a 12-inch turret.

Florida was the first American big ship to join the British Grand Fleet in the North Sea and was for thirteen months a unit of the Sixth Battle Squadron of the Grand Fleet. In the winter of 1917 Florida operated continuously in the North Sea and did convoy duty to Norway in addition to the regular manœuvres with the Grand Fleet. Florida on her first trip had three torpedoes fired at her. She also took part in the German Naval surrender and after escorting the President into Brest returned to New York for the big review here on the day after Christmas.

Lieut. William L. Barnard

WITH a record of having been Commodore of the Hingham Yacht Club, in 1912, 1913, 1914, and 1915, Lieutenant William Lambert Barnard, was always interested in the Navy and on March 21, 1917, was commissioned an Ensign in the Massachusetts Naval Militia and an Ensign in the National Naval Volunteers April 16, 1917. From April 7 until October 9 of that year he served as Executive Officer of U. S. S. Dupont on coast patrol duty. He was then appointed instructor in Navy Regulations and Seamanship at the Officers' Material School at Cambridge, Mass., where he remained until April 17, 1918. In the meantime, January 1, 1918, he had been promoted to Lieutenant, junior grade.

Leaving the Training School he was ordered to Washington, where he served in the office of the Chief of Naval Operations until August 15. Again he was promoted before leaving his assignment, being made a full Lieutenant July 1. From Washington Lieutenant Barnard was ordered to the Squantum Destroyer Plant, Quincy, Mass., for duty in connection with the fitting out of Delphy and since her commissioning he has been her Communication Officer.

Lieutenant Barnard is very well known as a yachtsman, for aside from having been Commodore of the Hingham Yacht Club, he was chairman of the House committee of the Boston Yacht Club in 1914 and 1915 and president of the Massachusetts Yacht Racing Association in 1915, and is still a member of the Hingham and Corinthian Yacht Clubs and an honorary member of the Yacht Racing Union of Massachusetts.

Lieut. George F. Newton, Jr.

SERVICE in American, Central American, South American, and European waters was the good fortune of Lieut. George F. Newton, Jr., who enlisted in the Naval Reserve Force as a Chief Machinist's Mate, on February 27, 1917. He served as an enlisted man with the patrol fleet of Boston Harbor until October 11, 1917, when he received orders to report immediately to the Naval Academy. February 1, 1918, almost one year after entering the service, he received his commission. Ordered to U. S. S. Nebraska immediately, he was on that ship when she sailed May 16, for South America. A stop was made at Bahia, Brazil, and others at Rio de Janeiro, Brazil, and Montevideo, Uruguay.

June 16, saw Nebraska leaving for the North with another stop at Rio and at Bahia where they picked up the Brazilian battleship San Paulo. For twelve days the two vessels steamed up through tropical weather until they put in at the Barbadoes. Ensign Newton was serving as one of the assistant navigators. July 16, Nebraska left the Island and five days later made Guantanamo, Cuba, base of the Navy's southern drill grounds. Hampton Roads was the next stop and all hands were given ten days leave. Ensign Newton was transferred to the transport Henderson and sailed from Philadelphia, August 13 for Brest. Orders came on August 26, for him to report to U. S. S. May, a converted yacht of 220 feet, doing convoy duty, with other yachts in and out of the Gironde River into the Bay of Biscay for 300 miles. He was on this duty when the armistice was signed. Proceeding to Brest, November 28, May was ordered back to America, but Ensign Newton, who had on September 21 been made a lieutenant, junior grade, was detached and made assistant to the Harbor Supervisor at Brest, and is apparently to remain for some time.

The Original Crew of Dawn

CRUISING on his own boat was the luck that befell Norman E. Donnelly, of Brooklyn, who was in his Sophomore year at Cornell when the call to arms came. Young Donnelly organized a crew for his own yacht Dawn from among his friends, and "put to sea" on May 7, 1917. They shoved off from the Bayside Yacht Club, Littleneck Bay, and headed eastward on a trip of 170 miles to Newport. The first night was spent at New Haven and the next day the mariners rounded Point Judith and ran to Newport harbor through a heavy sea from N. W. The first sign of war that greeted them was the net across the entrance to the harbor and the patrol boat that held them up. They were directed to report at the War College, where they were well received and Dawn had her first "once-over" by Navy officers, who pronounced her "just what they were looking for." The next morning they were given a half an hour's notice to get ready for a speed trial, which passed satisfactorily and the crew was sworn in and rated as follows:

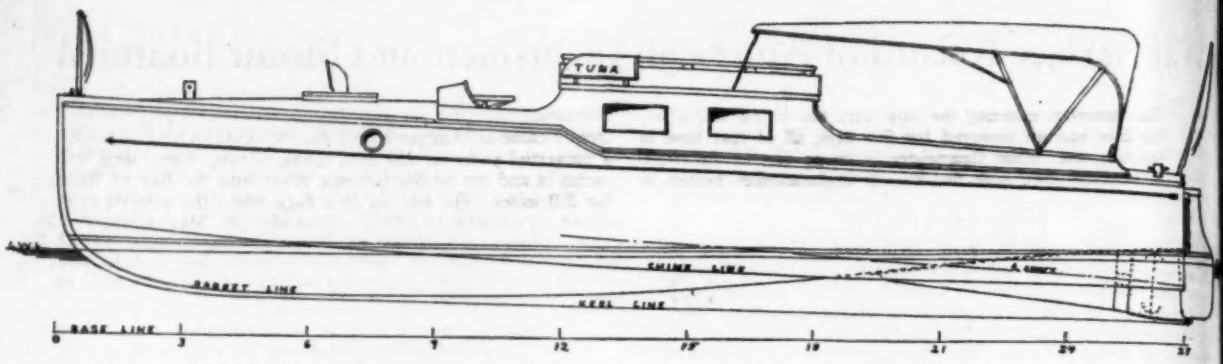
W. M. Jenks, Machinist's Mate, first class; R. H. Merrill, Quartermaster, third class; R. W. Schofield, Electrician, first class; S. F. Upham, Machinist's Mate, second class; W. C. F. Washburn, Gunner's Mate, third class, with Young Donnelly as Chief Quartermaster and commander. All of these youths were college men, Jenks and Merrill, also being from Cornell; Schofield from Polytechnic Institute of Brooklyn; Upham from Wesleyan and Washburn from the University of Pennsylvania. Later the crew was augumented by H. W. Marache, Yale University, whose home was in Brooklyn, Seaman, first class; and G. W. Rogers, Cornell University, of Newburgh, N. Y., Coxswain.

War color soon enveloped Dawn and she was changed to "S. P. 26. A machine gun was mounted on the forecastle and she began her duties on Narragansett Bay with Newport as her base and the tumbling waters off the Beavertail and the East and West passages for her cruising ground. Summer came and passed and one by one the original crew shouldered their sea bags and departed for other duties, and as winter came on, storms began to become frequent and with them lots of ice. But the boats had to go out just the same and fifty-six hours of constant patrol off the East passage in the dead of winter with the thermometer below zero, and the wind blowing a gale, the boat down at the head and continually going further for them. During the month of December S. P. 26 had 453 hours of patrol duty to her credit. Chief Quartermaster Donnelly was promoted to Ensign, along with five others of the original crew of Dawn, while one attained the rank of Lieutenant, junior grade.

Harry H. Johnson

CALLED into Federal service as a member of the Second Batallion of the Brooklyn Naval Militia April 6, 1917, the day war was declared, Harry H. Johnson was taken down to the Navy Yard, put on board U.S.S. Kentucky, and taught the fine art of coaling ship, painting and hauling stores. A few weeks later he was transferred to U.S.S. Arkansas at Yorktown, Va., and was in the deck force of that vessel a month and ready to be transferred to the Armed Guard service when he was sent to the dental office instead, remaining there for the duration of the war.

For a year and two months Arkansas sailed up and down the coast from Maine to Florida and finally was ordered to join the Sixth Battle Squadron with the British Grand Fleet. With Young Johnson as one of her numerous crew she steamed out of Hampton Roads July 14, 1918, and travelled a zig-zag course for ten days, making her first stop at the Orkney Islands on the northern coast of Scotland.



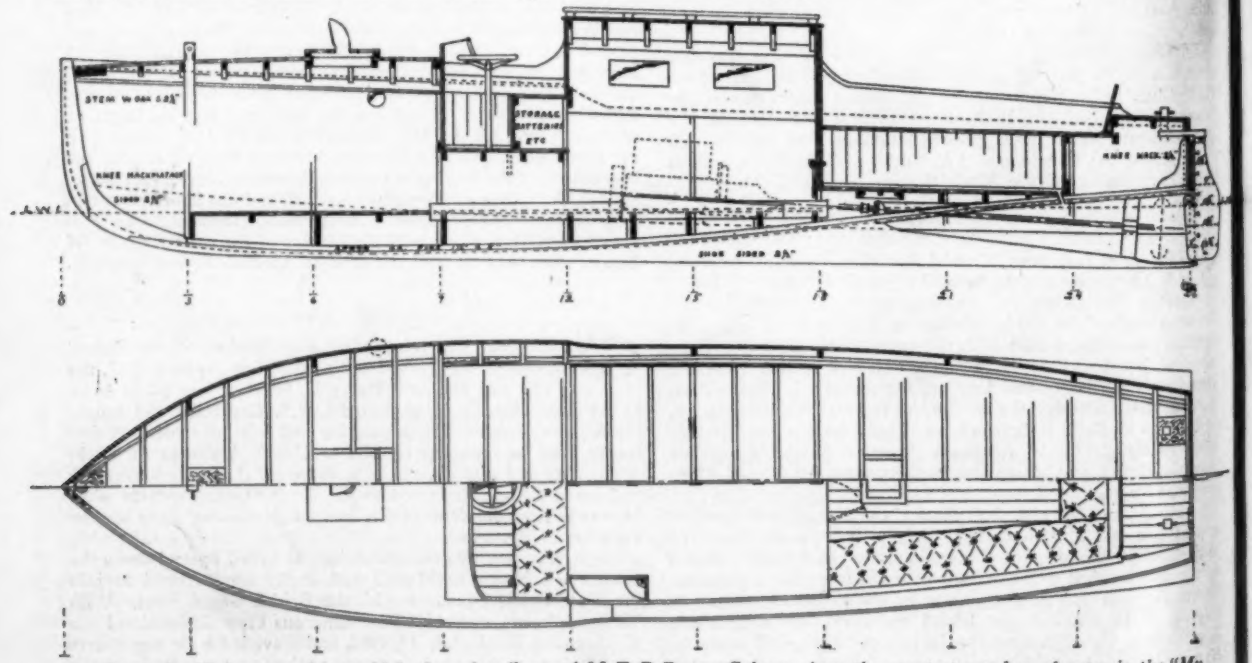
Tuna Is My Ideal Runabout

The Twenty-Seven Footer Designed by Howard A. Pike and Published in the February, 1918, Issue of MoToR BoatinG is Voted the Most Popular Runabout

TUNA has been voted the best type of the ideal runabout in the popular contest series of "My Ideal Runabout," conducted by MoToR BoatinG for the last year. The designs and description of this wonderful little craft were first published in the February, 1918, issue of this magazine from plans furnished by Howard A. Pike. Tuna is indeed an ideal type, combining as she does simplicity, yet gracefulness in design, strength, speed, durability and, above all, seaworthiness.

Entered in the contest with Tuna were L'Allegro, Hike You, Zora, Goblin, Sandpiper, America, Magnet, Curlew, and Panther. The contest was only open to amateurs—boatmen who knew from actual experience what they were talking about. MoToR BoatinG paid $35 in cash for each set of plans that was published and in addition gives a prize of $75 worth of boat equipment to the winner. Each subscriber was entitled to a vote.

Designing a runabout to meet two radically different conditions, the shallow waters of Narragansett Bay and seaworthiness at the same time, when the owner desired to use the craft for fishing trips off Block Island Sound, where the waters are sometimes rough, was a task that called for real designing skill. Mr. Pike decided that the craft should be 27 feet in length, 6 feet 8 inches beam and have a draft of 18 inches. The V-bottom type of hull was selected, and to obtain the shallow draft necessary Mr. Pike worked a reversed V aft in which the propeller turned. At rest the tips of the propeller are above the waterline, but after starting ahead the tunnel is filled with water and kept filled. A Kermath Vanadium engine, No. 20, was selected and a speed of 15 miles was expected, using a wheel 16 inches in diameter by 20 inches pitch, turning at 1,000 r.p.m. The interior arrangement, with the operator forward, the motor under a real trunk cabin amidships, where it is protected from the elements, and a roomy cockpit aft, completed a rough-weather desideratum. The high freeboard, ample flare and reserve buoyancy all aided the seaworthiness, while the tunnel effect in the underbody permitted navigation in shoal water. In the hull 3 feet 6 inches of freeboard was provided for. The steering cockpit is placed between the forward deck and the engine. This is 3 feet fore and aft and has a seat extending the width of the boat, large enough to accommodate three persons. Aft of the engine shelter is a larger cockpit 7 feet long, with seats on both sides and one athwartship. These will seat eight persons on either side. One under each seat are the gasoline tanks, cylindrical in form, of twenty-five gallons capacity each. A vacuum system of feed is used, as the tanks are rather low for gravity direct to the carbureter.



Tuna, the 27-foot runabout which the subscribers of MoToR BoatinG *have given the greatest number of votes in the "My Ideal Runabout" Contest*

New Boats for 1919 Are Appearing

A Great Lakes Cruiser and Other Sterling-Powered Crafts Are Announced

ANNOUNCEMENTS are coming rapidly from manufacturers now of the new boats for 1919, ranging all the way from dinks to the finest cruisers. Of the latter class, a modified V-bottom 60-footer that is to be delivered at the opening of the season is presently under construction by the Great Lakes Boat Building Corporation which embodies practically all of the new features which it has been possible to secure in a boat of this class. It is for Harry C. Stutz of Indianapolis and Miami and is to be used in cruising on the Great Lakes and on the Atlantic Coast between New York and Florida. A pair of six-cylinder model "F" Sterling engines are intended to develop a speed of 25 m.p.h. The hull is to be of white oak frames, Port Orford cedar planking, all copper and bronze fastenings. Staterooms, cabins and superstructure will be in natural mahogany. The Pullman berths in the main cabin are 38 inches wide, which is the standard Pullman car dimension. The engine compartment is between double laminated water-tight bulkheads and while all engine controls are carried to the steering column for one-man operation, a companionway leading from the chart house to the engine-room permits the wheelman excellent communication with the engine compartment.

An express cruiser built by the Great Lakes Boat Building Corp., designed to make 25 m. p. h., a pair of six-cylinder model "F" Sterling engines being used. The enclosed bridge deck makes a roomy cabin besides affording complete protection from the weather

Newcomb Carlton, president of the Western Union Telegraph Company, has purchased an open tender type which he has christened Sunshine. This boat is 18 feet by 4 feet 6 inches and attains 13 m.p.h., with the little Sterling Kid 10 h.p. motor.

Felicia, a 21-foot tender, owned by J. W. Lane, of New York and St. James, L. I., is an excellent design by Gielow & Orr and the construction is by Kyle & Purdy, Inc., who have built quite a number of these dinks. A 10 h.p., all-enclosed, four-cylinder Sterling motor, built expressly for this purpose, is under the deck. The motor has electric starting equipment and the boat can make 12 m.p.h. She has a 6-foot beam and is extremely snappy in appearance.

A new dink for Newcomb Carlton which is powered with a Sterling Kid

Felicia, built by Kyle & Purdy, Inc., for J. W. Lane and intended for the waters of Long Island Sound. A four-cylinder Sterling motor gives her a speed of 12 m. p. h.

How the Diesel Engine Proves In?

(Continued from January Issue)

PART III

By Herbert Haas

The surplus oil is connected in the crankpit and is filtered and cooled, and returned to the bearing by a pressure oil pump. A circulating system of this kind insures positive lubrication of the main bearings, whereas oiling rings may possibly stick.

Another system of lubrication, essential to high-speed and even medium-speed engines, and, on account of its satisfactory operation and sparing use of lubricants, favored increasingly for high-grade low-speed engines is now being used. Drilled passages run from the middle of the main bearings diagonally through the middle of a journal and the webs of the cranks and issue in the middle of the crankpins. The connecting rod is hollow. Whenever these passages register, a part of the oil, aside from lubricating the main and the crankpin bearings, is forced through the hollow connecting rod and lubricates the piston-pin bearing. The oil is initially forced under pressure through the covers of the main bearings. In other engines the oil is supplied through the bottom of each main bearing, permitting a simple arrangement of the oil piping and obviating the necessity of breaking pipe connections when the bearing covers are removed. The surplus oil is collected in the crankpit, flows to a filter through a cooler, and is returned to the bearings by a positive-pressure pump, driven direct from the main engine by either gearing or side cranks.

The lubricating system last described effectively lubricates the piston-pin bearing, which is of particular importance, as its position inside the trunk piston and in close proximity to the piston head subjects it to heat by absorption and conduction, in addition to the severe duty it has to perform regularly in transmitting the high piston pressures. Engines using centrifugal oiling rings have a separate oil supply for the piston-pin.

In vertical engines one of the plungers of a forced-feed oil pump used for cylinder lubrication delivers oil through a feed in the cylinder frame and the liner to a vertical groove in the piston. This groove is above the piston pin and is connected with drilled passages in the piston and the piston pin, and through these passages the oil is fed to the pin bearings.

In horizontal engines with trunk pistons the feeding of the piston-pin bearing is simple. An inclined oil-feed pipe provided externally with a wiper is fastened to the inner wall of the trunk piston. With every stroke of the piston a measured supply of oil furnished by a separate plump plunger is carried to the piston-pin bearing.

Main Bearings

The main bearings are usually semi-cylindrical, babbitted, cast-steel shells, carried by carefully machined seats cast integral with the bedplate, the shells being held down by their covers. They have no wedge adjustment, but rest rigidly in their seats. In practice it has been found difficult to keep numerous adjustable bearings in perfect alignment, and inequalities in adjustment of the different bearings have frequently led to broken shafts. With the bearings once carefully machined and aligned in the shop the wear over all bearings is uniform and light in high-grade engines, in which the bearings are flooded with oil from a forced-feed system, uniform bearing pressure being insured through an equally proportioned supply of fuel oil furnished to each cylinder. By raising the shaft slightly the shells can be rolled out for rebabbitting.

Connecting Rod

The connecting rod is forged of soft, low-carbon steel and has a hollow center in engines using forced-feed lubrication. Hollow rods are often used, especially in small engines, to decrease weight. The crankpin end is usually provided with a marine head, the boxes of which are either lined with babbitt or bronze, the head proper being of cast steel. The piston-pin end of the rod is usually slotted out of the solid to receive an adjustable box made of cast steel or cast iron lined with babbitt and bronze. Adjustment is made either by shims held by adjusting screws or by wedges. The positive rigidity obtained with square shims and adjusting screws is usually given preference over the wedge adjustment. For large engines a marine head for the piston end is sometimes preferred as offering greater ease of adjustment; however, it offers no advantages over the closed head when it has to be removed. The piston and rod of either type are pulled through the top of the cylinder and the rod is removed by knocking out the piston pin. In horizontal engines the pistons are pulled out of the open bottom of the cylinder, so that the heads do not have to be removed, an advantageous arrangement. Some types of vertical engines are so built as to permit pulling the piston from the bottom of the cylinder.

Pistons

On account of the relatively short connecting rod and the high pressure common to Diesel engines, the resultant side pressure on the cylinder wall is high. Therefore, the trunk pistons must be correspondingly long to keep the unit pressure within safe limits and to reduce excessive cylinder and piston wear. For this reason crossheads and guides were used during the earlier development of Diesel engines in Europe. On account of its many advantages the trunk piston has been adopted and is used in engines, even of 250 h.p. per cylinder and in units of 1,000 h.p. The trunk piston is more easily provided with a greater bearing surface than a crosshead, thus insuring less wear; the lubrication under pressure of a cylindrical guiding surface is more effective than with open guides. The piston moves over perfectly cooled walls, whereas the crosshead tends to heat more readily and when once hot is not easily cooled; moreover, water-cooled crossheads complicate construction. The use of crossheads and guides greatly augments the height or the length of the engine, increasing its cost. For large engines this construction is used, as it affords greater accessibility and ease of adjustment, the crosshead guide in such engines being water-cooled.

To confine the wear to an easily and cheaply replaceable part of the piston, in some constructions the piston on the side subjected to the reaction pressure is provided with soft, cast-iron wearing shoes, which can be raised slightly by the interposition of thin sheet-metal shims, when shoes and cylinder are worn. However, this construction is not extensively used, as, with good design and workmanship and thorough lubrication, the wear is slight and is noticeable only after years of work. Cylinder wear is usually due to an excessive sand or ash content in the fuel oil used and not to piston side pressure.

The cylinder liner is cast sufficiently heavy to permit of reboring.

From five to seven snap rings are used to seal the

cylinder. To hold the rings closed they are pinned together at the lap joints. They are pinned to the piston by a small dowel set in a hole in the groove. Such fastening is always necessary in two-cycle engines to prevent the ends of the snap rings from shifting around the piston and thus traveling across the exhaust ports and catching in them while they are being uncovered or covered by the piston.

At the bottom of the piston another ring is placed, serving as an oil-wiping ring and preventing the drawing of splashed oil from the crankcase and the reciprocating parts into the engine cylinder. This feature is of importance in a high-speed engine with a closed crankcase.

Pistons of small size are cast in one piece; those of larger engines are cast in two pieces. The limiting size for the one-piece and the two-piece construction differs widely with different builders. In the two-piece construction the piston top with the snap rings comprises about the upper one-third of the piston. In the lower piece is placed the piston-pin. That part of the piston subjected to intense heat and great wear by the impinging of the fuel and air jets can thus be cheaply replaced. The top of the piston is either a plane surface or has a concave depression. To reduce the clearance space to a minimum and to obtain the required compression, the piston is permitted to come close to the head when at its top center by cutting out recesses in the top of the piston for the air inlet and exhaust valves. To prevent excessive wear of the central top part of the piston upon which the fuel and the injection air impinge, a nickel or steel plate is sometimes cast into that part. Other constructions provide a small cone to distribute the fuel radially over the entire combustion space and to improve the combustion of the fuel. The construction of the piston is largely a matter of practical experience. The interior of the trunk is provided with reinforcing ribs for strength as well as for radiating heat readily. On account of the repeated heat changes and high pressures, the piston is heavily taxed. Notwithstanding, all material must be used judiciously and in the right place, as any excess iron will serve only as a heat accumulator and subject the piston to severe internal stresses caused by differences in temperature in different parts of the piston. A light piston is also desirable to reduce the weight of the reciprocating masses.

Large pistons are jacketed and cooled by oil, water, or air and water. The oil or water is either circulated through the jacket space, or the water is sprayed with air against the inside surface of the piston top.

In some engines oil is used for piston cooling, to prevent contamination with water of the lubricating oil in the crankcase, should the moving pipe connections supplying the cooling medium spring a leak. However, the use of oil as a cooling medium is not general as its specific heat is only about half that of water. Water is also far superior for transmitting heat. As satisfactory mechanical constructions have been developed that insure a continuous supply of cooling water to the piston with small likelihood of leaks, the use of oil has been superseded by that of water even by builders who have long adhered to the former practice.

The water for piston cooling may be circulated through telescopic pipes, with the stuffing box a moving part of the piston, or the stuffing box may be attached to the frame and the water be supplied to the piston through hollow walking arms through which the water flows to the pipes leading into the piston. A pump may be actuated from the crosshead and the water be carried to the piston through the hollow piston-rod. In another cooling system water is sprayed by air against the heated piston surface, not enough water being used to fill the water space of the piston. The excess water drains off through a pipe surrounding the spray pipe, no stuffing box being used.

There is no uniform practice among manufacturers regarding the size of engine at which a change from air-cooled to water-cooled pistons is made. Some use water-cooled pistons when the cylinder reaches 125 h.p. Others build air-cooled pistons for cylinders of 250 h.p. In construction involving a closed crankcase which gives little opportunity for air-cooling of the piston, the former practice is favored, whereas for horizontal engines in which the interior of the trunk and the part of the piston extending outside of the cylinder are exposed to the air the higher limit may be used.

Pistons of two-stroke cycle engines, in which the scavenging air is admitted through ports in the bottom of the cylinder, have special shaped tops to direct the flow of the scavenging air.

In horizontal engines, the ratio between the length of connecting rod and that of the stroke is generally greater than in vertical engines; a ratio of 3 is common, so that the reaction pressure against the side of the cylinder is usually less than in vertical engines, even allowing for the additional pressure due to the weight of the piston, which is always slight compared with the total side pressure on the cylinder.

The cylinders are lubricated by providing each cylinder with a force-feed pump operated by a reducing motion from the end of the piston, or with a multiple-plunger pump driven by an eccentric device or direct from the camshaft, one plunger being provided for each working cylinder and one for each air-compressor cylinder. In some engines two plungers per cylinder are provided, one for each pair of the four oil feeds grouped around the cylinder. Vertical two-stroke Diesel engines usually have a separate oil feed above and below the exhaust ports to prevent any excess of lubricating oil from being swept through the exhaust ports. Horizontal two-stroke engines usually have the exhaust ports in the sides of the cylinder, the parts of the cylinder serving as top and bottom guides being solid; the lubricating oil can then be so distributed over the bearing surfaces as to occasion little if any loss through the exhaust ports, and separate oil feeds are not needed.

Flywheel

Commercial as well as technical reasons impose limitations on the size of single-cylinder units. These seldom exceed 150 h.p. and then are usually confined to horizontal engines for industrial uses, allowing a liberal variation in speed. Two-cylinder units are built in sizes of 50 to 300 h.p., and three and four-cylinder units in sizes from 100 h.p. up. The flywheel of a one-cylinder engine, if used on a four-cylinder engine with the same size of cylinder and four times larger power will cause a cyclic regularity nearly 400 per cent. better than that of the one-cylinder unit. Multi-cylinder units are considerably lighter; the smaller-sized cylinders allow shorter strokes and therefore higher rotative speeds, and these reduce the required flywheel weight.

The maximum variation from uniform speed differs widely for different classes of work required of the engine. The irregularity factor may vary as follows:

For driving pumps, punches, shears, and machines requiring a low degree of regularity, one-twentieth to one-thirtieth.

Machine tools, looms, and paper machinery, one-thirty-fifth to one-fortieth.

Spinning machinery, according to class of work, one-sixtieth to one one-hundredth.

Direct-current generators, one one-hundred-and-fiftieth.

(To be continued)

Naval Activity and Yachting at New Haven

(*Continued from February* MoToR BoatinG)

Lawrence A. Howard, Lieutenant, U. S. N. R. F., Hartford Yacht Club. Enrolled at New Haven March, 1917, as Lieutenant J. G., was assigned to duty at Section Base 1, New Haven, where he has served throughout the war as Information Officer. He so distinguished himself in this service that he is one of the very few officers to be promoted higher than Junior Lieutenant. He had an all-around training as a naval officer through years of experience as a yachtsman, through spending much time in his boyhood on tugboats in both the engine-room and pilot house and finally through some years of experience in the Connecticut Naval Militia, as an enlisted man and commissioned officer. He owns the 50-foot yacht Sagamore II. In addition to the duties above mentioned, he served as Ordnance Officer and as instructor and lecturer on various subjects.

George G. Jones, Lieutenant T., U. S. N. Enrolled at New Haven in April, 1917, as chief machinist's mate, assigned to duty at Section Base 1, where he served chiefly as an instructor. He was recommended for the first Reserve Officers' course at the Naval Academy at Annapolis. He graduated in September, 1917, and was at once assigned to duty on board U. S. S. Columbia, as an engineering officer. He made several voyages from New York to the war zone, convoying merchant vessels and was in September, 1918, transferred to shore and served as instructor with the Yale Naval Training Unit for a few weeks, after which he was again assigned to sea duty as an engineering officer of a transport. He was promoted to Lieutenant J. G., after about one year's service and shortly thereafter to Lieutenant.

Joseph T. Kelly, Boatswain's Mate, First Class, U. S. N. R. F., New Haven Yacht Club. Enrolled at New Haven in 1918 in his present rating. Was assigned to duty at Section Base 1 for training. After four months he was rated boatswain's mate, first class, and transferred to the Ensigns' School at Pelham upon recommendation of his commanding officer. Here he was released from active duty, after the cessation of hostilities before finishing his course.

Carlton Lewis Marsh, Lieutenant j. g., U. S. N. R. F., New Haven Yacht Club, U. S. Power Squadron. Enrolled at New Haven as Chief Boatswain's Mate, March, 1917, assigned to duty at Section Base 1, where he served in the capacity of instructor and sometimes as commanding officer of U. S. S. Laura Reed, a training vessel at this base. He was transferred to the training camp at Pelham when it opened, and was there assigned to duty in the Naval Auxiliary Reserve School, where he was commissioned ensign, assigned to sea duty on U. S. S. American, made several voyages to France and was recently promoted to Lieutenant J. G.

Charles A. Maynard, Lieutenant, U. S. N. R. F., New Haven Yacht Club. Commanding U. S. S. East Hampton, S. P. 573. Entered the service as a member of the Connecticut Naval Militia of which he was navigator when the war began. He was assigned to duty in command of a torpedo boat and was later transferred to the command of a group of mine sweepers operating in the First Naval District, in which service he has continued throughout the war. He has special qualifications for naval service through several years' training on sailing vessels of the merchant marine, where he served before the mast and as an officer. This was followed after several years by service as enlisted man and commissioned officer in the Connecticut Naval Militia.

Humphrey Morris, Boatswain's Mate First Class, U. S. N. R. F. Enrolled at New Haven in March, 1917, was assigned to duty at Section Base 1, New Haven, together with a large number of other Yale undergraduates; served under training until July, when he was assigned with about forty other men from this station to U. S. S. Guinevere. This vessel, upon fitting out, proceeded at once to the North Sea and served as a patrol vessel for several months until she was wrecked. Boatswain's Mate Morris was then assigned to the Mine Sweeper Douglas, operating from a French base, and was still on this duty when hostilities ceased. He was known as an excellent seaman when under my command and I believe he deliberately declined opportunity for promotion to commissioned rank because it involved leaving the war zone and returning to home waters.

John K. Murphy, Lieutenant, U. S. N. R. F., New Haven Yacht Club, U. S. Power Squadron, Commanding Section Base 1, Third Naval District, and Commanding Squadron 5, Third District Naval Force. Enrolled at New York as Lieutenant early in March, 1917, and was immediately assigned to command of the Section Base at New Haven for which duty his eleven years' experience from seaman to Lieutenant-Commander in the Naval Militia, brief experience in the Spanish War and life-long experience as a boatman and yachtsman best fitted him.

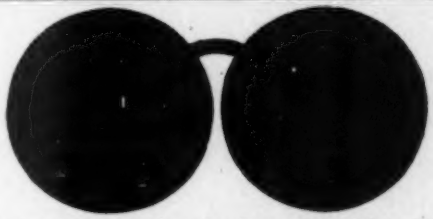
John J. Phelps, Lieutenant j. g., U. S. N. R. F. This officer, although he had had experience in the Spanish War as an officer on board large vessels and was therefore fitted for more important and more comfortable duties, enrolled as an ensign in order to command the 60-foot Greenport chaser, Perfecto, S. P. 86, which he built and presented to the Government. The adventuresome duties expected for these small chasers appealed to him. He served on the Cornfield Net Patrol; based at New Haven with this vessel during the summer of 1917; was then given command of U. S. S. Calumet and assigned to the Ambrose Channel Patrol for a time. Later he was given command of a Division of Submarine Chasers, in Lieut. LeSauvage's Squadron, doing submarine defense duty off New York. This squadron had important and I believe as exhausting and hazardous duties as any in the naval service. I have not been lucky enough to hear his experiences as yet and hope he may write of them himself. He is the owner of a small fleet of power and sailing yachts, which may be seen at his summer home on one of the Thimble Islands, just east of New Haven.

Raynham Townshend, Lieutenant, Medical Corps, U. S. N. R. F. Enrolled at the beginning of the war to serve as medical officer of Section Base 1, which he has been since that time. Having been an enlisted man and for several years medical officer of the Connecticut Naval Militia and being a physician and surgeon of high repute, the station has benefitted greatly by his services. On account of Dr. Townshend's experience, and of the excellent physical facilities of the section, untrained hospital corps men were sent here for training. Dr. Townshend has long been a member of the New Haven Yacht Club and has served as Fleet Surgeon.

New Things for Motor Boatmen

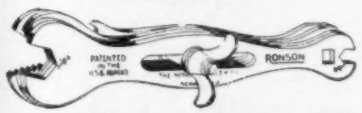
Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.

A searchlight that is particularly valuable aboard the small motor boat or a power dinghy. A spring-operated reel of wire within the base allows the removal of the lamp for use as a trouble lamp, etc.

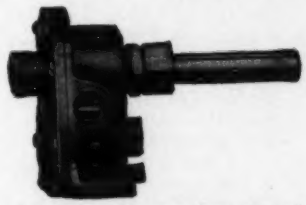


There are a number of things aboard a motor boat that must be found in the dark such as push buttons and switches, whistle cord, electric light chain pulls, valves, and many others. It is now possible to mark the position of these things at night by means of a luminous knob or a button that fits over a tack or screw head

There are often occasions when it is desirable to put the shut-off cock on gasoline, oil or compressed air lines under the floor or behind a bulkhead. Here is a neat shutoff cock with extension handle for just this purpose

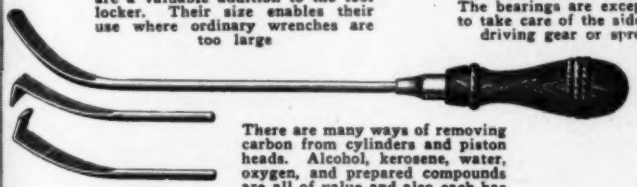


Although not intended or suitable for heavy work this set of wrenches are a valuable addition to the tool locker. Their size enables their use where ordinary wrenches are too large



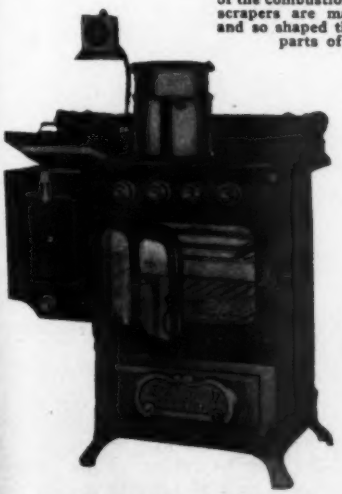
A rotary pump possessing many advantages. It has the drive shaft located near the base, which reduces the strain on the holding-down bolts. The bearings are exceptionally large to take care of the side thrust to the driving gear or sprocket chain

Magnetos, pumps, and other auxiliaries mounted on hand-hole plates, etc., are apt to get out of alignment. This coupling will take care of misalignment either vertically, horizontally, or an angle in the shaft line



There are many ways of removing carbon from cylinders and piston heads. Alcohol, kerosene, water, oxygen, and prepared compounds are all of value and also each has its particular objection. With a set of three scrapers, as shown above, it is possible to work through the valve cap openings and spark plug holes and scrape the carbon from the entire surface of the combustion chamber. These scrapers are made in two sizes and so shaped that they reach all parts of the cylinder

How many boat owners have need of a spanner wrech for the stuffing box, pump glands, and other purposes but cannot find one that will fit? Here is an adjustable spanner wrench that is made in several sizes to fit almost any size nut or gland



A combination electric stove and cooker that should be a favorite aboard the larger yachts. The cooker, at the left side, is operated much the same as the ordinary fireless cooker without the electric heater

This life preserver suit has several advantages over similar suits. It is made of rubber, the only really waterproof material. It has no metal frames or clamps, and the wearers' hands are free, not in mittens

It is often desirable to clean the strainer on the gasoline line without shutting off the supply. This duplex strainer with three-way by-pass valves provides for opening and cleaning one strainer while the other is in use

Do not fail to write to the editor if you desire information concerning any of the above new things

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

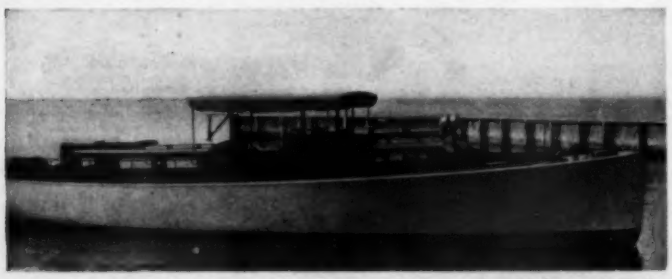
Sales and Charters of Important Craft

The houseboat Swordfish, one of the largest and best known houseboats in the country, has been sold to the United States Junior Naval Reserves for a training ship by Tams, Lemoine & Crane, of New York City, acting for Schuyler Schieffelin. This firm has also sold the motor yacht Virginia to commercial interests, the motor yacht Wa-Shi-Shi-Wa, and the fast cruising launch Mystery which went to Mrs. Peter Cooper Hewitt, who will use her on the Sound this season.

W. K. Vanderbilt has chartered the houseboat Ruff House through this firm and the craft is now in Florida waters. Thomas W. Lamont, of J. P. Morgan & Company, and owner of the New York Evening Post, has chartered the 70-foot motor yacht Tuna, while the 90-foot motor yacht Williams '18, formerly Grayling was sold to Charles Schedel. This boat had been purchased by Justus Ruperti to loan to the Government during the war as a sub chaser. Genesee, a 140-foot auxiliary, has been sold for J. S. Watson to a prominent New York yachtsman and is now being overhauled.

Price Correction

Through a typographical error the Sonora Phonograph Sales Co., of New York City, advertised its Sonora Portable, light-weight phonograph for $50 when the price should really have been $60. This error only appeared in the February issue, as the phonograph has previously been advertised at $60. This ideal instrument plays also disc records of all sizes perfectly without extra attachments and weighs only fifteen pounds complete.



Altonia an express criser designed to make 30 m.p.h. She was built by the Purdy Boat Wks., of Miami, Fla., for A. C. Newby, of Indianapolis, and Robert Maypole, of Chicago

Lloyd C. Herring Now with L. W. Ferdinand & Co.

Lloyd C. Herring, for more than thirteen years connected with the Boston office of the General Electric Company, and for the last ten years assistant to the District Manager of the Apparatus Sales Department of that company is now with L. W. Ferdinand & Co., of Boston. This company makes a specialty of marine glues and Mr. Herring expects to deal with many of his motor boat friends in his new capacity.

Elliot Gardner to Design Fast V-Bottom Runabouts

Elliot Gardner, of 104 South St., Stamford, Conn., has severed his connection with the Luders Marine Construction Company, where he was employed on war work for the Government for the last year, and has opened an office in Stamford. Mr. Gardner will specialize in drawing designs for fast V-Bottom Runabouts and express cruisers and all types of small pleasure craft. He has been in the boat business for about ten years and has designed many of the fastest boats in the country. As designer for one of the country's large boat building establishments for the last five years Mr. Gardner is well and favorably known among motor boat owners, although in some instances the boats were constructed without the owners having an opportunity of meeting the designer personally, owing to the press of other business.

The Navy Wants Recruits

The Navy is making an especial appeal to all water lovers and yachtsmen in particular to enter the regular service and recruiting offices have again been opened in cities and towns throughout the country for enlistments. Men who desire to become electricians or machinists are particuly desired and those between the ages of eighteen and thirty-five years who have had a small amount of experience, either in shops or on their own boats may enter the service and go through a complete course.

Machinists are sent to the machinists' school at Charleston, S. C., and electricians to the electrical school at Hampton Roads, Va. For apprentice seamen the age limit is seventeen years, providing the youths have the consent of parents or guardians. Recruits are also being accepted as bakers, firemen, machinist's mates, hospital apprentices, and mess attendants.

Prossen Now with Nilson-Miller Co.

L. P. Prossen has resigned as mechanical superintendent of the Black & White Taxicab Co., of New York City, to become associated with the Nilson-Miller Co., engineers and machinists, of Hoboken, N. J. Mr. Prossen has been elected vice-president and will be in charge of the gear cutting, piston, and piston ring departments.

Ezy-Out screw extractors designed to meet the need of the amateur boat builder or the huge shipbuilding yard

A Screw Extractor to Save Profanity

When a screw breaks—be it a set or a cap screw, a stud, a pipe fitting or whatnot—the Ezy-Out screw extractor, it is claimed, by its manufacturers will remove the broken section quickly and easily. It is only necessary to drill a hole in the broken screw, insert Ezy-Out, slap a tap wrench and twist—and out comes the broken section—on its own threads, without danger to the threads of the original hole—and all in a fraction of the time required by the file-punch—and—profanity method of the past.

For the sake of economy and convenience the manufacturers have collected their screw extractors into three handy sets—each set designed to fill the requirements of a given field. One set is designed with particular reference to the needs of the tool room and the lighter type of machine-shop work. Another set is for general utility service in machine-shop, garage, and factory. A third is the heavy shop set and is designed especially for shipyards and boat construction plants where heavy construction is undertaken.

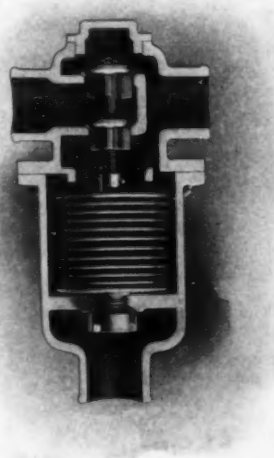
Endurance, a Sterling-Powered Runabout

Endurance shown in one of the accompanying illustrations can make 27 m.p.h., thanks to her Sterling, Model FS, four-cylinder engine developing 100 h.p., and turning a Columbian F propeller 18 inches in diameter and having a 28-inch pitch, at the rate of 1,400 r.p.m. She was built by the Niagara Motor Boat Co., of North Tonawanda, N. Y., after designs by John L. Hacker, of Detroit, Mich., and is owned by J. J. McFadden, of New York.

A Mechanical Device That Did Its Bit

When the German submarines appeared off the American coast last summer the Navy Department ordered Sylphon Thermostats by the score, for this device operating by hydrostatic pressure, released the dreaded T.N.T. in the depth bombs at just the proper depth and was invaluable in fighting off the U-Boat menace in our waters. The Fulton Co., of Knoxville, Tenn., manufacturers of this device, worked day and night to fill the Government's orders. When in defiance of the much vaunted German Navy, American sailors planted in the North Sea a great mine barrier of 70,000 mines, the releasing device of the mines was the Sylphon.

The eyes of the Army—those daring aviators, whose altitude records were the envy of the airmen of the world, were ceaselessly and regularly, during prolonged flights, at high altitudes, provided with just the proper amount of oxygen by means of inhalators, the hearts of which were Sylphons. After flame and gas attacks, in the first aid stations, Sylphon accurately and automatically aided in resuscitation by controlling the artificial breathing devices of the Gas Defense Service. In the thickest of the fight, the tanks made their relentless progress, driven by powerful motors on which Sylphon Thermostats were standard equipment, and finally, behind the lines, camions, lorries, trucks, and staff officers' cars hurried hither and yon, driving at highest efficiency—the motor temperature controlled by Sylphon Thermostats.



Sylphon thermostats were used in all branches of the service in the war; land, sea, and air

War Work Improves 50-Footers

Having completed Government work on which the energies of the plant have been engaged for the last year or more the Albany Boat Corp., of Watervliet, N. Y., is again busy on the construction of fine speed boats and cruisers. The experience the company secured in doing war work has been put to excellent advantage in the construction of their new 1919 50-foot cruisers. In this craft they embody the best features of those constructed in ante-bellum days along with later improvements developed during the war.

Joseph Leopold Now with Jones-Motrola, Inc.

Lieut. Joseph Leopold has resigned from the Aviation Corps of the U. S. Army and is now associated with the Jones - Motrola, Inc., of New York City, as mechanical engineer and sales manager. Mr. Leopold prior to the war was chief engineer of the Walker M. Levett Co., of New York City.

The Jones-Motrola, Inc., is headed by Joseph W. Jones, as president, and Robert Graves, as secretary and treasurer.

This attractive boat was designed by John L. Hacker, and built by the Niagara Motor Boat Company for J. J. McFadden, of New York

Durkee Co. Have Breathing Space at Last

Charles D. Durkee & Co., New York City, announce that they are again in a position to give prompt and careful attention to all civilian orders. The company states that it realizes that for the last year and a half it has not been able at all times to give these orders the attention to which they were entitled. This is due to the fact that during the war period the Durkee company considered it to be its patriotic duty to devote most of its energy to the production of goods for Government purposes.

Arthur T. Murray Heads New Bosch Co.

The announcement is made that the American Bosch Magneto Corporation has taken over the entire holdings and organization of the Bosch Magneto Company, including the great Bosch works at Springfield, which comprises 230,000 square feet in the building alone and employs 1,500 operatives and the complete services and selling systems of the old Bosch company throughout the United States.

Arthur T. Murray, who more than any other individual has been responsible for the amazing success in organizing the Bethlehem Motors Corporation is to be president of the new corporation and to direct all Bosch activities. At the time of the taking over of the Bosch holdings in America by the Alien Property Custodian, Mr. Murray's appointment by the Government as its managing director had much to do with keeping the Bosch plant in operation and his handling of the extremely difficult situation which the operation of the Bosch activities involved would seem to indicate his ability to continue to produce Bosch ignition systems upon the same high plane that they have been formerly produced.

It is the plan of the American Bosch Magneto Corporation to greatly extend its scope in the field of ignition and to acquire even greater prominence in automotive industries than it has heretofore enjoyed. Mr. Murray is also to continue as active head of the Bethlehem Motors Corporation. During the war 85 per cent of the Bosch output was put to Government use.

Norway Needs Gasoline to Revive Boating

Whether motor boating as a sport will be resumed in Norway this summer is greatly dependent upon the amount of gasoline which will be exported from America. In an endeavor to have increased supplies shipped to his country Sverre Nilsen, Jr., an importer of machinery of Christiana, Norway, has written to the Universal Motor Company of Oshkosh, Wis., to secure that firm's cooperation. This is a matter of importance to American manufacturers of motors and doubtless strenuous efforts will be made to have an adequate supply go forward.

A Hot Plug to Start a Cold Motor

M. H. Tracy Co., of New York, eastern distributor for the Gulowsen-Grei crude oil engines, advise us that Arthur A. Aamoot, designing engineer at their new Seattle plant, has just developed a remarkable new electric hot plug which permits starting their engine from stone cold within thirty seconds. With the hot bulb ignition they use it was formerly necessary to heat the bulb in each cylinder with a blow torch before the engine could be started. Now the current can be turned into the electric hot plug which permits starting almost instantly. A special heat resisting wire is used so that the plug will not burn out under 2,000 working hours, therefore, the plugs should last the lifetime of the motor because the current is only turned on for five or six minutes, after which the regular hot bulb ignition is operative because the bulb has become heated by the combustion in the cylinders.

Motor Boats Change Hands

George T. Lippincott, prominent member of the New York Yacht Club has sold his 110-foot twin-screw power yacht Aeldgytha to a Western yachtsman through the brokerage firm of Cox & Stevens. Aeldgytha is powered with two 200 h.p. Diesel motors and is one of the very few yachts fitted with heavy-oil engines.

Cox & Stevens have also consummated a number of other transactions, among them being the sale of the 90-foot twin-screw cruising power yacht Sachem to A. M. Andrews of Chicago, who contemplates using it on the Pacific Coast. This boat was in the estate of N. Bruce MacKelvie, of New York. Another was the sale of the 95-foot flush-deck auxiliary ketch Zahma for J. Harold Rich of New York to a member of the New York Yacht Club, for service in Eastern waters; the sale of the 95-foot overall flush-deck auxiliary schooner yacht Fedalma for John Candler Cobb, of Boston to a New York yachtsman; the charter of the 90-foot twin-screw gasoline houseboat Bolo for A. Felix DuPont, of Wilmington, Del., to George Lauder Carnegie, of the New York Yacht Club for service in Florida waters this winter; the sale of the 75-foot twin-screw houseboat cruiser Marold for H. S. A. Stewart, of the New York Yacht Club to Walter J. Hill. This yacht has been renamed Wacouta and is now in commission in Florida waters.

Other boats that changed hands through this firm were: Trusan, Antares, Dacota, Isle III, Laurus, Weent, Wa-Shi-Shi-Ma, Merry Sunshine, Adelaide, Sirion, Lucile, Mermaid, Regina, Flavia, Troubador, Sea Wold III, Lucinda, Bellehazen, Regina, Wealaka, Camilla, Lady Betty, Princess Fabius, Querida and New Jersey.

Issuance of Licenses to Pleasure Boats

The War Trade Board has announced that they are now prepared to issue bunker licenses to pleasure boats, not carrying cargo, valid for a period of three months, to cruise between ports of the United States, Bermuda, and the West Indies.

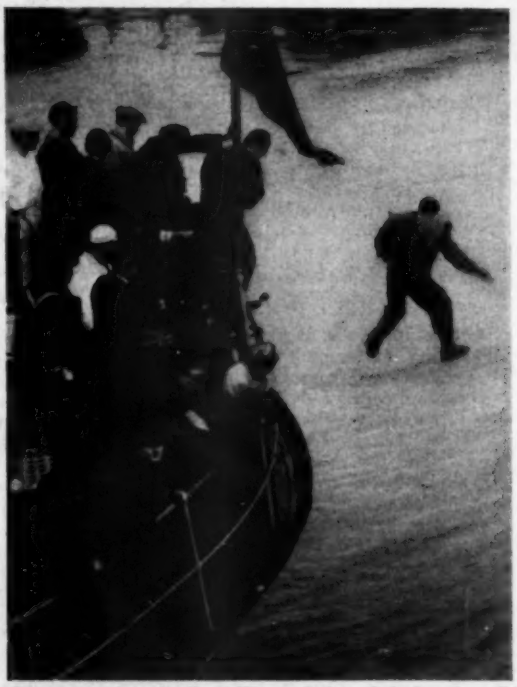
The licenses will be issued on the regular forms used for trip licenses, with such changes in phraseology as may be necessary. Bunker Form B-3—Master's Report on Voyage, and Bunker Form B-7—Affidavit and Agreement of Master of Vessel Governing Disposition of Cargo will not be required.

The monthly report of fuel and supplies taken out of the country and the report of fuel consumed, heretofore required for all time licenses, will also be waived as a general rule, but applicants should place themselves in a position to furnish these reports if called upon to do so.

In presenting applications to agents of the Bureau of Transportation, or Collectors of Customs, on the regular application form (Bunker Form B-1-a) care should be exercised to outline fully the cruising radius of the vessel, for which bunker license is applied for.

Wm. H. Rountree Represents Oberdorfer

The M. L. Oberdorfer Brass Co., of Syracuse, N. Y., advise that they are now represented in New York by Wm. H. Rountree, of 154 Nassau St., New York City. Mr. Rountree is well known in the gas engine and motor boat trade from his former connection in the motor boat supply line. A stock of Oberdorfer bronze geared pumps is being carried with the idea of making prompt deliveries. These pumps are now used as standard equipment on Red Wing, Kermath, Gray, and several other popular marine motors and are recognized as standard by machinery, auto and tractor manufacturers. They have been on the market for over a quarter of a century and their reputation has grown steadily as the pumps have been tried in new uses. It is expected that the appointment of Mr. Rountree will be a great convenience for Oberdorfer customers in New York as it will enable them to receive the benefit of personal attention, from a representative of the company who will take an interest in their wants. This will make for greater satisfaction.



Demonstrating the Ever-Warm Safety Suit for the officers and men on board U. S. S. Nansemond while in dock at Hoboken, N. J. This suit is manufactured by the National Life Preserver Co., of 11 Broadway, New York City

Trade Literature

New Booklet on Rope

A handsome booklet describing the manufacture of rope from the time that the manila fiber is secured from the wild banana plant, which grows exclusively in the Philippines, until it is ready for use has been issued by the Plymouth Cordage Co., of North Plymouth, Mass.

Van Blerck Motors Issues Handsome Brochure

A truly handsome booklet lavishly illustrated in colors from marine paintings and actual photographs has been issued by the Van Blerck Motor Co., of 50 Church St., New York City. The illustrations include cruisers, runabouts, and express cruisers and are intended to show convincingly what really fine boats are powered with Van Blerck motors. The motors illustrated and described represent a new line of Van Blerck engines which the company states is the logical evolution of the Van Blerck motors which have gone before.

"Leakproof" Booklet

The L. W. Ferdinand Co., of Boston, Mass., have printed and are issuing to motor boat owners a little booklet called *How to Make Your Fishing Boat Leak-proof*. This system, as explained in the booklet, is said to be ideal for stopping punctures and leaks in five minutes. It is from an article published in the Outer's Book in May, 1917, by E. H. Coultas.

A New Edition of the Gas Engine Book

The second edition of Clark's *Marine Gas Engines*, a book on the practical systematic treatment of the care, operation and construction of the standard types of engines, including the new development of Diesel and oil engines, has just been published by D. Van Nostrand Co., 25 Park Place, New York City. The first edition of this book attained a large sale which necessitated the new edition.

W. H. Moreton Represents Sterling

The Sterling Engine Co., of Buffalo, N. Y., is now represented in the New England territory by W. H. Moreton, of 214 State St., Boston, Mass., with whom is associated Morris Brotherton, well known in boating circles in that district as having been associated with the previous representative. This, the company states, assures Sterling owners in the New England territory of excellent attention on installations.

Advertising Index will be found on page 100

Advertising Index will be found on page 100

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Advertising Index will be found on page 100

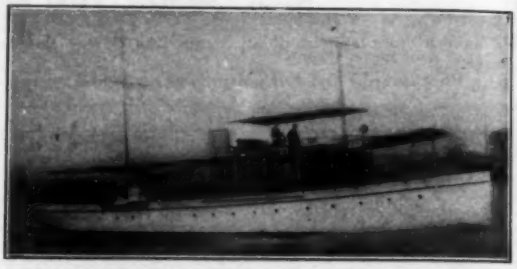
Naval Architects and Yacht Brokers

COX & STEVENS

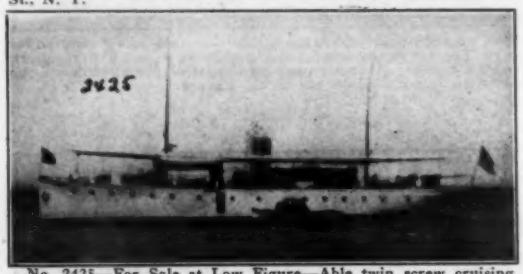
15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.

No. 3541—For Sale or Charter—Particularly desirable 100 ft. steel twin screw cruising power yacht. Practically in commission; very attractively furnished and finished. Speed up to 15 miles; two 6-cyl. air-starting and reversible Standard motors. Fitted with every convenience. Large dining saloon and social hall on deck; five staterooms, bath, two toilet rooms, etc. Without doubt finest of type and size available. Cox & Stevens, 15 William St., N. Y.



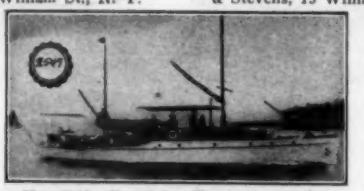
No. 1796—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William St., N. Y.



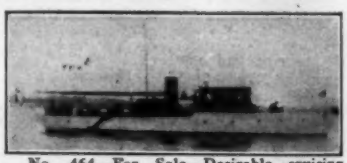
No. 2425—For Sale at Low Figure—Able twin screw cruising power yacht. 90 x 16.6 x 4.6 ft. Speed 11½ miles; two 6-cylinder 60/80 h.p. motors. Two double staterooms, large saloon, bathroom and two toilets. Cox & Stevens, 15 William St., N. Y.

No. 2954—For Sale—Twin screw power yacht; 71 x 65.6 x 13.3 x 3.6 ft. Speed up to 16 miles; two 6-cyl. 90 h.p. Speedway motors. Dining room forward; 3 staterooms, bathroom and vestibule containing transom berth aft. Price attractive. Cox & Stevens, 15 William Street, New York.

No 2601—For Sale—Fast 80 ft. oil burning, patrol type steam yacht; built 1917 by Herreshoff. Speed 17 knots. Large cruising radius. Hot water heating plant, wireless outfit, etc. Reasonable offer wanted. Cox & Stevens, 15 William St., N. Y.



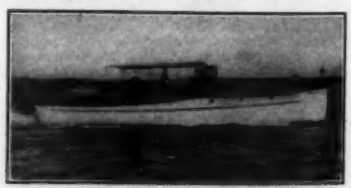
No. 2547—For Sale—Handsome, modern, exceptionally able gasoline cruiser; 64 x 12.6 x 4 ft. Speed 11½ miles; 60 h.p. 6-cylinder heavy duty motor controlled from bridge. Main saloon, toilet and separate galley forward; engine room amidships; double and single stateroom and bathroom aft. Cox & Stevens, 15 William St., N. Y.



No. 464—For Sale—Desirable cruising power yacht, 81 x 13 x 4 ft. Speed up to 15 miles; 6-cylinder 100 h.p. air-starting Standard motor. Dining saloon in deckhouse forward, two double staterooms, two toilet rooms, etc. Offer desired. Cox & Stevens, 15 William St., N. Y.

No. 3529—For Sale—Fast bridge deck cruiser; 60 x 10.6 x 4 ft. Built 1916. Speed up to 18 miles; 8-cylinder 215 h.p. Van Blerck motor. Dining saloon containing pullman berth and transom forward; double stateroom aft. Electric lights. Price and further particulars from Cox & Stevens, 15 William St., N. Y.

No. 3517—For Sale—High speed twin screw bridge deck cruiser; 52 x 11 x 2.9 ft. Built 1917. Speed up to 28 miles; two 8-cylinder Van Blerck motors; 215 h.p. each. Large saloon containing two transom berths, toilet room, etc. Electric lights. Owner has purchased larger yacht through our office. Cox & Stevens, 15 William St., N. Y.



No. 3035—For Sale—Fast and very roomy bridge deck cruiser; 47 x 10 x 3 ft. Speed 16 miles; 100 H.P. 6 cyl. 4 cycle motor. Separate galley, saloon and single stateroom forward, besides double stateroom and toilet room aft. Electric lights. First class condition. Cox & Stevens, 15 William St., New York.

No. 1806—For Sale—Twin screw power yacht; 67 x 14.6 x 3 ft. draft. Speed up to 13½ miles; two 40 h.p. Sterling motors. Large saloon with two extension berths, 2 staterooms, bath and toilet, etc. Roomy bridge deck and large cockpit. Price from Cox & Stevens, 15 William Street, New York.

No. 3613—For Sale at Bargain—V-bottom bridge deck cruiser; 40 x 9 x 3 ft. Speed up to 16 miles; 85 h.p. Sterling motor. New 1917. Double stateroom and saloon sleeping 6 people comfortably. Large bridge deck forward and cockpit aft. Used very little. Cox & Stevens, 15 William Street, N. Y.

No. 2758—For Sale—Attractive bridge deck cruiser; 65 x 13 x 3.6 ft. draft. Speed up to 12 miles; 65 h.p. "20th Century" motor. Two staterooms, saloon with two extension berths, bath and toilet room. In excellent condition. Owner has purchased larger yacht through us. Cox & Stevens, 15 William Street, New York.

Advertising Index will be found on page 100

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word, minimum 75 cents. If an illustration is used, the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, 1¾ columns wide..... $5
Cut 2¼ inches deep, three columns wide.....$15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month
Please mention MoToR BoatinG.

20 foot Raised Deck Cruiser, 4 H.P. Lathrop engine, fully equipped, cushions, tools, lights, etc. Sacrifice $225. Address Boat, Box 828, Hartford, Connecticut.

Motor boat hulls, from 12 to 50 ft., all styles, with and without power, at reasonable prices. Good used engines, all types, cheap. We can offer you a good bargain in a complete motor boat or motor only. Tell us what you would like to have and we will quote our lowest price. Atlantic Supply Co., Long Branch, N. J.

FOR QUICK DELIVERY, at low prices, high grade, heavy duty, marine crude oil engines of 40, 60, 75, 85, 112 and 150 B. H. P. Recent changes in owner's plans makes these engines available. Jacobson Engineering Co., 5 Second Ave., Rensselaer, N. Y.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

Motor Boat, Mahogany, 48 foot by 6 ft. 6 in. Six cylinder Speedway motor. Speed 20 miles per hour. Boat and engine in best condition, guaranteed. Prize boat in appearance, fully found throughout and sleeping accommodations. Apply G. F. Burrell, 163 Dowling Ave., Toronto. Location of boat at present, Alex Bay, New York.

A 30 H.P. Mertz & Weiss, 2 cylinder Kerosene Marine Oil Engine, complete with clutch, shaft and propeller, thoroughly overhauled. Bargain. Room 1814, Astor Trust Bldg., New York City.

FOR SALE—12 H.P. Kalenberg motor. 35-40 H.P. heavy duty Truscott. 40-50 H.P. Continental. Model 34 Loew-Victor-Harbeck 6 cylinder, 114 to 190 H.P. 2 cylinder 2 cycle 30 H.P. T. & M., 9-12 H.P. Universal with electric starter, and 120 others. Get our complete list. Jesick Boat Co., Grand Rapids, Mich.

BOSCH Magnetos: All types $10.00 each and up—Coils—Remy, Splitdorf, etc., $3.00 and $5.00—Low Tension Magnetos $3.50—Presto Tanks $5.00—Leather Cushions $1.00—Spot Lights $3.40—Lighting Generators $9.00—Carburetors all types $5.00 and $8.00—Auto Motors, both water and air cooled, all sizes $30.00 each and up. Write for bulletin. Johnston, West End, Pittsburgh, Pa.

Three Kermath Marine Engines 12-16-&-20 H.P. All new. All 4-Cylinder 4-Cycle. A Bargain to the buyers. W. W. Warren, Box 774, Hartford, Conn.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

WANTED—Modern up-to-date Runabout—25 to 35 ft. long. Self starter and complete equipment. Box 15, MoToR BoatinG.

FOR SALE—2 360 H.P. Duesenberg Marine engines, new, 8 cylinders 6¾" x 7¾"—each $5,000. Also a 72-foot new motor boat, equipped with three of these engines, speed 35 miles an hour. Cost $52,000—Our price $35,000. Box 25, MoToR BoatinG.

FOR SALE—House Boat, 18 x 45, four rooms and bath furnished or unfurnished, nearly new. Seen at foot Hillside Avenue, Great Kills, Staten Island, Capt. Pearson, or write for blue prints to Von Tobel, Sea Side Hospital, New Dorp, Staten Island.

Marine and automobile engines 1 to 100 H.P. Best makes—good condition—very low prices. State your power needs. We take engines in trade. What have you? Magnetos, coils, carburetors, mechanical oilers, water pumps, etc. Also car parts of every nature—sacrifice prices. Write about your requirements.
Badger Motor Company, Milwaukee, Wis.

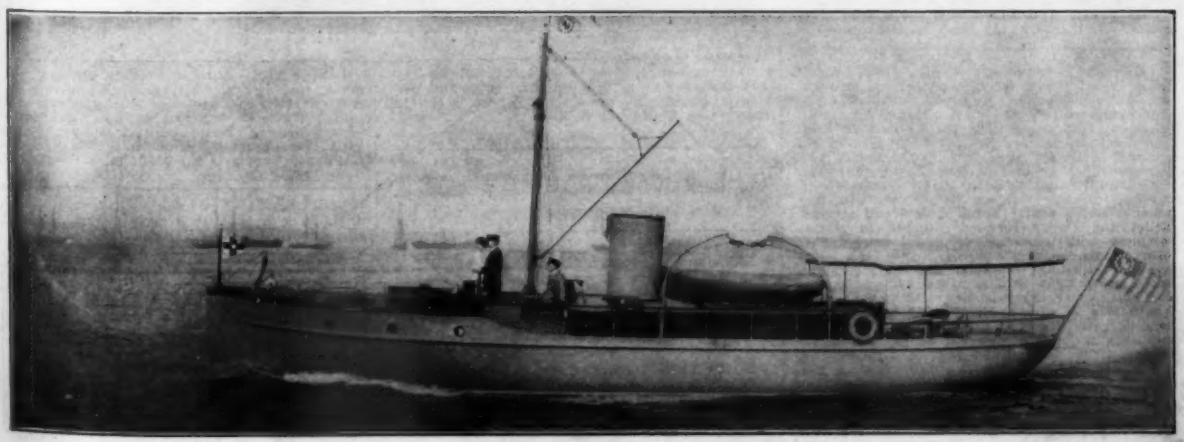
CANADIANS, Second-hand engine bargains. Send for list.
GUARANTEE MOTOR COMPANY
73 Bay Street, North Hamilton, Ont., Canada

Trimount Whistle Blower Outfits
Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

Trimount Rotary Hand Bilge Pumps
All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., East Dedham, Mass.)

FOR SALE—Famous 51 ft. bridge deck cruiser Alsorie III, flag-ship of the United States Power Squadrons. This boat was designed by the well-known firm of naval architects, Swasey, Raymond & Page of Boston, Mass., and built by the Camden Anchor Rockland Machine Co. The over-all length is 51 ft., her beam 10 ft. 1 in. and her draft 4¼ ft. The fuel tanks have a capacity of 180 gallons. The hull is constructed throughout of Maine oak and North Carolina pine with decks of white pine. Interior arrangements consist of a double stateroom forward, owner's stateroom, engine room with a 4-cylinder 30 H.P. motor, galley, ice-box, and complete cabin aft. Full inventory. Speed 10 miles per hour. Price $8,500. For further particulars apply to C. N. Burnell, 77 Franklin St., Boston, Mass.



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Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, 1⅝ columns wide..... $5
Cut 2¼ inches deep, three columns wide..... $15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month. Please mention MoToR BoatinG.

No. 3594—FOR SALE—Miss Liberty, Great Lakes Express Cruiser, 52 ft. x 11 ft. x 3 ft. Built 1918. Has been used successfully on Great Lakes, St. Lawrence River and Lake Champlain. Is equipped with 8-cylinder (5¾ x 6½) Sterling motor, 200 H.P., which gives a speed up to 24 miles.

This craft has several features which one will not find in other boats of her type or size. The interior finish is of finest mahogany. The boat's accommodations are very well laid out. The forward cabin, with upper and lower berths, sleeps four comfortably. The after cabin, with double berths, sleeps four people. Both cabins have large toilets. The cabin equipment is very complete; large, mahogany dining table (folding), silk curtains for all ports and windows, Victrola, etc.

The boat's electrical equipment affords many conveniences not found on a boat of this type. There is an electric telephone system between the different compartments; electric heaters for cabins, electric cigar lighters for cabins and bridge deck; fans for all cabins. There is also installed electric lighting plant, water cooled. This plant supplies 1,000 Watts 32 volt current for all lights on boat, including running lights as well as necessary current for electric heaters. Another convenience is an electric water pump maintaining constant pressure on all faucets; also used to fill tanks.

This craft has been kept in excellent condition regardless of expense and is as good as new. It is a very popular type of boat which always enjoys a good market. Arrangements can be made to inspect the boat by applying to

COX & STEVENS, 15 WILLIAM STREET
NEW YORK CITY

FOR SALE—30 H.P. heavy duty 4 cycle, 4 cylinder Vulcan engine, bore 6½, stroke 7¼, all complete, magneto, coil, clutch, shaft, wheel, $3.50. Ed. Keil, Glenworth Ave., North Beach, L.I.

FOR SALE—22-28 H.P. high speed 4 cylinder, 4 cycle Speedway engine in good condition, $350. The above engine can be seen at Ed. Keil, Glenworth Ave., North Beach, L. I.

FOR SALE—Doman heavy duty marine twin cylinder motor, six to eight horse, 4 x 5, 4 cycle, reverse gear, Conn. coil, force feed oiling, weight 550, perfect condition, used less than 90 days actual service. List $400. First check $160 takes motor. H. H. Clark, 519 High St. Oshkosh, Wis.

FOR SALE—Auxiliary sloop "Miss Swift." Built 1910. Finest heavy construction throughout—no iron used. Fully found with best available equipment. 42 ft. O. A., 30 ft. W. L., 10 ft. beam, 7 ft. draft, 3000 lbs. of lead on keel. Completely overhauled last spring at cost of six hundred dollars. Used but five seasons; two owners with very best of care. Cost new $4000. Sails and rigging new in 1916, complete with covers. Bronze tackle. Large cabin in mahogany, sleeps four. Large closets and lockers. Toilet and Galley forward, finished in white; complete with lockers, cupboards, refrigerator, stove, pump, cooking utensils, dishes, etc. Mahogany self-bailing cockpit, ten h. p. engine under water-tight hatch. Heavy copper tanks; 200 gals. water, 50 gals. gas with pump. Full length awning with flyscreens, blankets, pillows, bedding, etc. Anchors, lights, etc. Very fast and able having won ten out of thirteen races. Cruised from Chesapeake Bay to Canada. In rough weather is the equal of any boat of her size afloat. Mahogany, bright finish power tender 18 ft. canoe. Inspectable at Narragansett Bay. Sacrifice for $1200. Box 2, MoToR BoatinG.

FOR SALE—Cruised 40 x 8. Fine condition. Loew-Victor motor run only about 500 miles. Will sell for a reasonable price as owner has a larger boat. Address 447 Washington St., Brookline, Mass. Can be seen at Baker's Yacht Basin, Quincy, Mass.

Will exchange house lots, valuation $6000.00 and cash, for up to date cruiser. State full particulars concerning cruiser and where it can be seen. Box 1, MoToR BoatinG.

FOR SALE—Cruisers, runabouts, motors, equipment new and used. Box J, Thomson, N. Y.

Skiffs and V-bottom hulls. A limited number of high grade boats at exceptionally low prices. Bronx Boat Works, foot Willow Ave. bridge, near East 132nd St., New York City.

FOR SALE—2 cylinder, 2 cycle, Cyclone Vim. Just rebuilt at factory. This is a speed engine, 12 to 15 horsepower. 125 Dollars—nothing doing on any lower price. D. J. Browne, Hampton, New Hampshire.

FOR SALE—Auto or marine engines, magnetos, carburetors, steering-wheels, lighting generators, coils, spot-lights, reverse-gears, universal joints, mufflers. Everything for your boat at lowest prices. Boats built from your plans. Write for quotation. Now is the time to buy. Haviland Supply Co., 2306 Seventh Avenue, New York City.

FOR SALE—New work boat, never been used, 36 x 9, 18 H.P. 4 cycle engine. Ed. Keil, Glenworth Ave., North Beach, L. I.

AFTER WAR SALE

New WISCONSIN VALVELESS MOTORS 4 to 25 H.P., 1, 2 and 3 cylinder at less than cost. Ask for Catalog.

WISCONSIN MACHINERY & MFG. CO.,
Milwaukee, Wis.

Advertising Index will be found on page 100

The Service of Thrills

(*Continued from page* 13)

was an even break as to whether the men on the little boat were going to be able to make those aboard the larger one understand that they were the Patrol before the latter blazed away and went ploughing on their voyage serene in the conviction that another submarine had been sent to that elastic locker of Davy Jones. When the steamer had been made to understand and had come to, it was another perilous feat for the Eighty Footer to run alongside and her commander reach the swaying rope ladder let down from the decks far above without smashing his frail craft against the sides of the big fellow.

Patrolling in the North Sea was a man's sized job for fair. Based as the Grand Fleet was, in the latitude of Greenland, the men on the Motor Boats suffered severely. For days at a time they would be forced to go without freshly cooked food when the seas were so rough that it was impossible to keep a pot or a pan on the fire. Even hot drinks were an impossibility at times and as the lookouts stood out in the open the wind would cut and slash its way through their thick blanket coats or "duffels" as they were called and find its way inside of the Alaskan Parkas with which they covered their heads and faces and warm coursing blood would feel like little rivulets of ice coursing through their veins. Then the spray that came over, not in flying splashes, but in huge crashing Niagaras, and while the oilskins and sou'westers did their best, the water seeped through and the stiff and half-frozen men would be relieved by others who would unflinchingly take their own turns at standing watch. Out there it was watch and watch and a Motor Boat on Patrol was about the least comfortable place to be this side of —— well, almost any place you can think of.

Orders to save gasoline were emphatic and a little boat would run to a designated position and then shut off the engines and drift with the wind and current for perhaps a morning or an afternoon and at times all of the daylight hours.

An incident of the North Sea Patrol as told in the Elco Brochure bears repeating here.

"It was usually in the early morning that we would come upon U-Boats, afloat on the surface, recharging their batteries," says the author.

"One murky morning, when a bad sea was running, we suddenly came upon a huge submarine, wallowing in the

(*Continued on page* 60)

Graphic Navigation

(*Continued from page 21*)

28. EIGHTH STEP.—The Particular Formula In Use Follows:

Hav. t = Log. Cosec. p, Log. Sec. Lat., Log. Cosin. s, Log. Sin. (s — h), in which s equals ½ (h + Lat. + p).

Proceeding with the problem, tabulate the arguments we now have to produce s and (s — h).

Designate such parts as are needed in the formula. Thus:

h	29°	58′	3″.6	
Lat	28°	15′	30″	.....Log. Sec.
p	68°	26′	42″	.....Log. Cosec.
	125°	99′	75″.6	
2)	126°	40′	15″.6	
s	63°	20′	7″.2	.....Log. Cosin.
h	29°	58′	3″.6	
s—h	33°	22′	4″.2	.....Log. Sin.

29. Having obtained all the parts necessary, multiply them together as indicated by the formula.

The most convenient way is by means of Logarithms. Table 44 Bowditch.

Logarithms of functions of angles, from zero to forty-five degrees, will be found by reading from the top of the page down, and the angle is found in the upper left-hand corner of the page.

Logarithms of function of angles, from forty-five to ninety degrees, will be found by reading from the bottom of the page up, and the angle is found in the lower right-hand corner of the page.

30. NINTH STEP.—Get the Logarithms.

Lat. being less than 45 degrees, read from top of page down.

In column marked Secant and in line with 15 in the column of minutes under 28 degrees, take out the Log. 10.05508, and in the near column marked Diff. and in line with 39 in the minute column under 28 degrees, take out 3. Combine this with the Logarithm to allow for the number of seconds in our angle, thus: 10.05508 + 3 = 10.05511 = Log. Sec. Latitude.

31. TENTH STEP.

p being greater than 45 degrees, read from bottom of page up.

In column marked Cosecant in line with 26 in the column of minutes over 68 degrees, take out the Log. 10.03152, and in the near column marked Diff. take out 3 in line with 42 in the minute column on the left of the page.

Subtract because the greater the Cosecant the less the Log.

Whereas minutes are referred to either column, seconds are referred to the left-hand column only, reading from top of page down. Combining, we have 10.03152 — 3 = 10.03149 = Log. Cosec. p.

32. ELEVENTH STEP—Log. Cosin. s.

In line with 20 over 68 degrees, take out the Log. 9.65205, and in near Diff. column take out 3 in line with 8 in seconds column (left of page). Subtract, as the Log. decreases the greater the angle. Thus: 9.65205—3 = 9.65202 = the Log. Cosin. s.

(*Continued on page 84*)

[redacted] Form Complete as Follows:

July 15th, 1918, p.m.
Lat. by D.R., 28° 15.′5 N.
Height of eye, 50 feet.
C—W, 6h 30m 15s
C.C. plus 32s

Obs. Alt. ☉	30°	18′	20″	.....W.T.....	4h	1m	12s	10h Eq.t —	5m	44s.4
Obs. Alt. ☉	29°	47′	50″	.....W.T.....	4h	3m	32s	½ H.D. +		0s.15
Obs. Alt. ☉	29°	26′	10″	.....W.T.....	4h	5m	13s	Eq.t for G.M.T. minus.	5m	44s.55
	88°	91′	80″	.....	12h	9m	57s			
Obs. Alt. ☉	29°	50′	46″.6	.....W.T.....	4h	3m	19s			
I.C. ± (none)			00″	C — W +	6h	30m	15s			
	29°	50′	46″.6	Chro. T.	10h	33m	34s	10h Dec. +	21°	33′.5
Dip. —		6′	56″	C.C. +			32s	½ H.D. —		0′.2
	29°	43′	50″.6	G.M.T.	10h	34m	6s	Dec. + for G.M.T.	21°	33′.3
Ref. —		1′	41″	Eq.t —		5m	45s			
	29°	42′	9″.6	G.A.T.	10h	28m	21s		90°	00′	00″
Par. +			8″					Dec.	21°	33′	18″
	29°	42′	17″.6					p	68°	26′	42″
S.D. ±		15′	46″								
h ⊙	29°	58′	3″.6								
Lat.	28°	15′	30″	....Log. Sec.....	10.05511						
p	68°	26′	42″	....Log. Cosec.....	10.03149						
2)	126	40	15.6								
s	63°	20′	7″.8	....Log. Cosin.....	9.65202						
h	29°	58′	3″.6								
s — h	33°	22′	4″.2	....Log. Sin.....	9.74037						
				Log. Hav. t.....	9.47899	equals	4h	26m	20s	L.A.T.	
				G.A.T.	10h	28m	21s	July 15			
				L.A.T.	4h	26m	20s	July 15			
				λ	6h	2m	1s				
							15				
				Long.	90°	30′	15″	west, Ans.			

The Service of Thrills

(*Continued from page* 57)

trough, but were too close upon her to use our gun—and we rang for full speed ahead, aiming to ram her just aft of the conning tower.

"I ran to get a lance-bomb (a long stick, looking like a large bull-rush, with a TNT bomb for a head)—and was running forward to hammer-throw it at the sub—when we struck her head on.

"The force of our rush made us ride up on her deck, leaving her apparently uninjured and smashing our bow.

"It was a very ticklish situation. We all jumped for guns and pistols, watching the silent conning tower for the next move.

"Slowly it opened and a man stepped out on the deck of the submarine.

"Every move he made was deliberate, unhurried—and semed to breathe contempt—as he walked slowly over to the bow of our M. L.—with all our eyes centered upon him intently.

"Finally he turned to us, bowed—and asked, in good London English, if we wouldn't like a tow.

"We had rammed an English E-Boat and the man speaking to us was her skipper. I'll pass over briefly how we felt. I still had the lance-bomb in my hand, poised for a throw—and looked particularly foolish. But it was often impossible to distinguish an E-Boat from a U-Boat, and we couldn't afford to take chances."

Searching for mines was a ticklish part of the work of the Motor Boats for this hunt led them frequently into the known enemy mine fields. These "eggs," as the men called them, were generally sewn just a few feet below the surface and the Eighty-Footers were equipped with wire sweeps designed to bring them to the surface without exploding them. Once on top the marksmen of the little vessels would start in to explode them by rifle fire. It was necessary to strike one of their "horns" with a bullet in order to detonate the mine and explode it and with a rocking boat, a bobbing mine and a "horn" an inch or so in circumference it required an expert rifleman to do the job.

When the attacks were made on Zeebrugge and Ostend the Motor Boats were picked for dangerous duty. They not only led the way in and set flares to guide the larger ships but they had to trail the ships destined to block the harbors right into the heart of the German ports, over mine fields and through gun fire of the most concentrated nature in order that they might rescue the crews from the ships that the British intended sinking to block the channels. At Ostend two of these boats were assigned to torpedo the ends of the pier and through all of that Hell of shot and shell they dashed out at the designated spot and at the appointed time they fired their torpedoes and the ends of the piers crumbled and slid away while the roar and crash of the explosion drowned out for the moment even the heavy gun fire of the German port batteries and the British monitors lying off shore.

Advertising Index will be found on page 100

Among the Clubs

Steamboat to Serve As Home for Maryland Motor Boat Club

BECAUSE of difficulty in securing the proper space for a clubhouse or of getting a suitable building the Maryland Motor Boat Club of Baltimore has purchased the steamboat Charles H. Werner and leased from the City of Baltimore the wharf at the foot of Hanover Street to moor their club to. The new location is just a little further up Spring Garden than the old site. The Werner is 145 feet overall, and 33 feet beam. It is proposed to remove all of the machinery and paddle wheels and use the entire lower deck for canoe racks, shower baths, lockers, etc. The second foredeck will have a pipe awning over it and be converted into an outdoor lounging room. The salon which is 90 x 28 feet will be divided with folding doors 25 feet from the forward end, thus making a reception room 25 x 28 feet. Next to this will be the ball room 50 x 28 feet, then another set of folding doors will make a smoking room 15 x 28 feet. In order to make a good dance floor a veneer covering will be laid.

The hurricane deck which is 90 x 28 feet is also to have a canvas awning its entire length and up here the club will hold moonlight dances during the summer. The Board of Governors will use the pilot house as a meeting room. The new boat home is expected to be ready for occupancy early in April, and Secretary Charles A. Reck states that the Club will be glad to welcome all visiting yachtsmen.

The old home of the Club was offered to the Government for its use during the war and when the offer was declined was sold to the Western Maryland Railroad Company for use as a railroad Y.M.C.A. Since that time the Ariel Rowing Club has been temporarily housing the Club.

Pavonia to Celebrate Anniversary

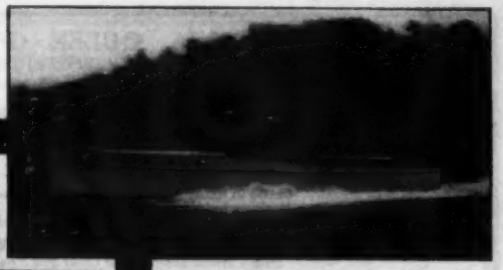
THE fifty year buoy will be turned by the Pavonia Yacht Club, of Bayonne, N. J., on March 16, when it will celebrate its half-century of existence in a generous manner by a beefsteak dinner. In its call for the reunion the committee says:

"Fifty years of good fellowship which only true sportsmen can understand will be celebrated. This spirit has continued from 1869 when our fleet consisted of a lot of sandbaggers, through the years of motor boats, down to the present year when our membership boasts of a flying ace, and a hydroaeroplane tugs at its moorings in front of our club grounds.

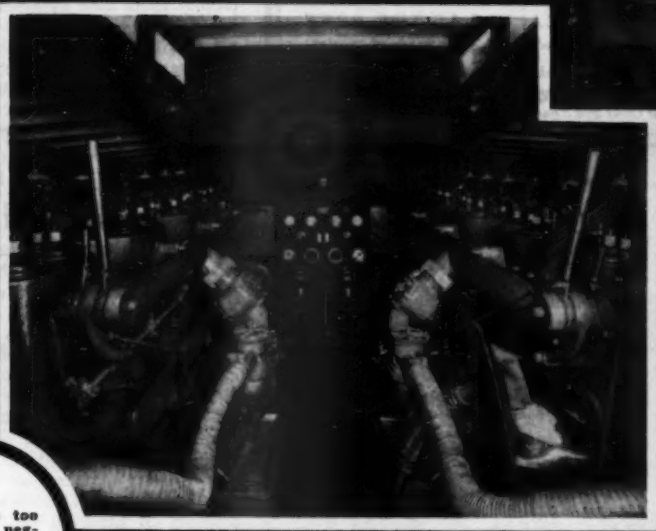
"The committee will make the anniversary a never-to-be-forgotten occasion. We are going to wine and dine the inner man, but the real part of the

(*Continued on page 64*)

Advertising Index will be found on page 100



The Albany Standardized Fifty-foot Cruiser, with the deck house reduced to accommodate pilot only.



Engines are too valuable to neglect — these are well lighted and easily accessible.

Here is an engine room that is different. Care can and will be given motors in such a clean, light place.

Your Crew will boast of This Cruiser

NOT alone of its graceful lines and speed ability, its luxurious appointments, but also of the thoughtfulness displayed for their comfort and conveniences for work.

The Albany Standardized fifty foot Cruiser is a one-man boat, although a fo'castle in the bow provides comfortable quarters for two, with ample lockers.

The engine room, usually a place of little consideration, is a triumph for Albany Standardization. It is reached directly from the bridge deck, and is flooded with light through the glass sides of the dining table in the deck house. There is seven foot headroom and easy accessibility to all parts of the motors. The galley is a big one with a 3-hole stove and oven and all equipment ample for long cruises. Here is a boat your crew will stay with and give the service that means real happiness with your boat.

For yourself there's a big double cabin with toilet—a guest cabin with toilet—and a delightful glass-enclosed deck house.

An experienced cruiser enthusiast styles this boat—

The biggest little ship afloat

This fifty-foot Cruiser has some little sisterships—26, 30 and 35-foot Runabouts, and 36 and 40-foot Cruiser. We do not issue complete catalogs, but compile bulletins, plans, specifications, etc., for each boat separately, giving maximum information. When you write, please state which type and size of boat you are interested in.

Albany BOATS

Albany Boat Corporation, 701 Broadway, Watervliet, N.Y.

Advertising Index will be found on page 100

Among the Clubs

(*Continued from page 62*)

celebration must necessarily be furnished by those members whose memories can take us back to the days when Pavonia's sailing yachts took many a trophy from able opponents. When we lift our glasses as a toast to the future prosperity of our club, let us feel that we are joined by the spirits of those members who have long since sailed their last race; let us pledge ourselves to do as much to keep our Club among the leaders as they did."

Handsome New Home for Southern Yacht Club

THE finest yacht clubhouse in the South and perhaps the finest waterside clubhouse in the entire country is to be constructed by the Southern Yacht Club of New Orleans, who contemplate tearing down its present commodious structure on Lake Pontchartrain on the outskirts of the City and replacing it with an even larger and much handsomer building. The building proper is to cover a plot over the water 300 feet in length by 110 feet in width. The club has a certain amount of land on the beach but the new building, like the present one, is to be constructed on piles and stand out in the lake proper. This will permit running small boats right under the club and bathers to descend directly from the lower deck into the water.

(*Continued on page 82*)

Yachtsmen Who Perfected the U. S. N. R. F.

(*Continued from page 9*)

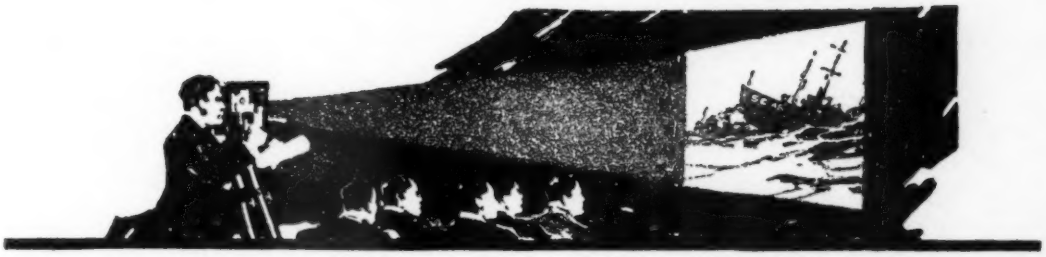
important units of the District.

A highly efficient rifle range was contracted and operated by Reserve officers at Rumford, R. I. To it came the sailors and marines of the District and its records show the development of many fine shots. The District Communication Service, which embraced the all important control of wireless operations, was entirely a Reserve activity.

Practically all of the Commandant's official family was composed of Reserve officers. Lieut. Newbold L. Herrick was senior aid and Ensign Arthur Hickman, junior. Lieut. (jg) Bellamy was Aid for Operations. Clayne School, the District's college for officer material, was conducted by Lieut. Alexander Hamilton Rice. Lieut. (p c) F. M. Schnotola brought the Pay Corps of the District to a high state of efficiency and as Liberty Loan officer, led all the other Districts in the Fourth drive.

In conclusion, it can safely be said that the worth of the Reserve idea is proven. The experience of the Second District is, without doubt, that of all the other Districts, and therefore, can be taken as an illustration of the whole organization. The fact is this:

The Reserve furnishes men of such calibre that no obstacles can stand in their way when an emergency exists. It is because the country can, in time of need, call these men and be certain of their immediate response, that the future of the Navy is assured.



For That Club Smoker

The Pathé Motion Pictures of U. S. N. 110-foot S. C. boats in action have created excitement wherever shown. The Standard Company has these Pathé pictures in one reel which it will be glad to loan without cost to any Yacht Club desiring it.

We should like to hear from all club secretaries and promise the club members ten minutes of genuine *thrills,* as well as enlightenment on fleet maneuvers at sea; employment of depth bomb against submarines, and the engines.

Write, giving club night arranged, to

STANDARD MOTOR CONSTRUCTION COMPANY

125 Pine Street **Jersey City, N. J.**

Reproduced from The Graphic, London

MR. WILSON'S NAVAL FORERUNNERS

The Warships, which the United States sent to European waters immediately after the rupture with Germany, prepared the way for Mr. Wilson's coming visit. Their great task finished, they are now gradually returning home, and the success which has attended their efforts in association with the British, French and Italian Fleets, has made possible and necessary the President's voyage hitherwards to assist in arranging the terms of peace which victory now enables the Allies to impose on the enemy. In this picture is shown a portion of the American naval forces at a British port, consisting of the "mother ship" Melville, torpedo-boats in the near vicinity, and "chasers"—akin to our M. L.s—in the foreground—the types of vessels which proved so deadly to the U-boats, and so materially contributed to the hastening of Germany's downfall.—*The Graphic.*

Advertising Index will be found on page 100

Sandusky Dinks

"the famous Davis Dink to be known from now on as the Sandusky Dink"

The Ideal Tender

For many years the famous "Davis Dink" has been accepted by the boating world as the ideal tender for any boat. Owners of the finest yachts afloat have been among the first to specify "Davis Dinks" when approving plans and specifications.

From now on the "Davis Dink" is to be known as the "Sandusky Dink." The change is in name only—the quality of material and excellence of design will remain the same.

"Sandusky Dinks" are light, strong and serviceable. Both row and power are continually in stock in sizes from 8 to 16 feet.

Send for catalog to-day

Sandusky Boat & Cabinet Works, Sandusky, Ohio

TEN LIGHT OUTFIT

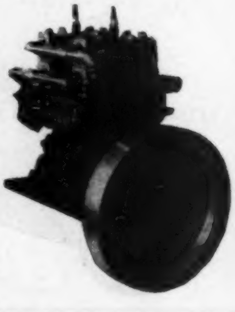
(120 Candle Power) 12-volt System

Write for Bulletin No. 60

THE DAYTON ELECTRICAL MFG. CO.

Dayton, Ohio, U. S. A.

Its The Perfected Superior



Its the greatest advance of a decade in design.

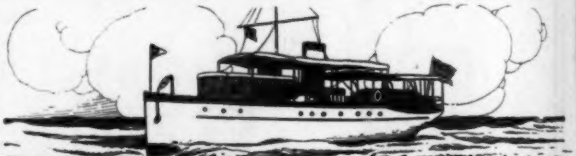
Its mechanically operated intake valve makes it the equal of four-cycle motors in economy, reliability and flexibility, and its remarkably sturdy construction gives it even more than the average two-cycles ability for hard work.

Its built with 1, 2, 3 and 4 cylinders. 6 to 24 H.P.

Find out about it.

Superior Motor Works

Jackson, :-: Mich.



Sonora Portable

THIS is the ideal light weight phonograph for you. It plays all makes of disc records, all sizes perfectly without extra attachments and has the famous Sonora tone.

Weighs only 15 pounds, complete. Price, $[illegible]

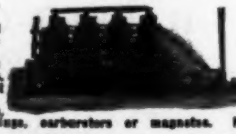
Sonora Phonograph Sales Company, Inc.
George E. Brightson, Pres.
279 Broadway, New York
Demonstration Salon: Fifth Avenue at 53rd Street

THE BOAT UPHOLSTERY

CHASE Leatherwove

L. C. CHASE & CO., BOSTON

OIL ENGINES



PAY BIG DIVIDENDS.
They use 3c fuel oil instead of 20c gasoline.
SAVE 75% on your fuel bills.
PAY for their cost in a year's run.
No batteries, wires, switches, spark plugs, carburetors or magnetos. NO TROUBLE.

MISSOURI ENGINE CO., 2808 N. 11. St. Louis, Mo.

HONEST CLAY

The Engine for Strenuous Service

Designed to work 24 hours a day, 365 days in the year. *Less* moving parts than any other four-cycle engine. 4 H.P. to 110 H.P. Single, double and four cylinder models. Correspondence solicited with dealers where we are not represented. The Honest Clay has given satisfaction for over 21 years—the pioneer workboat engine.

Fishermen, Workboat Owners, Write or Call and See Us.

The Clay Engine Manufacturing Co.
584 East 72 St. CLEVELAND, O.

PUMPS

Made by the

Lipman Mfg. Co.

for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.

233 Pleasant St. Beloit, Wis.

SCHEBLER

CARBURETOR

Standard of the World

Consistent Winner of Motor Boat Races

The Wheeler-Schebler Carburetor Co., Inc.,
Indianapolis, U. S. A.

INTEGRAL CAMSHAFTS

We make them for the leading builders of marine, airplane and automobile motors. We are Integral Camshaft Specialists, insuring the utmost in quality of workmanship and materials, accuracy and uniformity.

Let us quote on your designs.

MUSKEGON MOTOR SPECIALTIES CO.
Muskegon, Mich.

High Speed Sea Sleds and Surface Propeller Boats

THE VIPER CO. Ltd.
Picton, Nova Scotia

MURRAY & TREGURTHA CO.
340 West 1st Street
South Boston, Mass.

FINISHED CRANK SHAFTS

We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel, Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.

P. H. GILL & SONS FORGE AND MACHINE WORKS, BROOKLYN, N. Y.

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Advertising Index will be found on page 100

Advertising Index will be found on page 100

Advertising Index will be found on page 100

Advertising Index will be found on page 100

SPEEDWAY CRUISER
Length, 52′; Beam, 11′4″; Draft, 3′0″.
4 cylinder 75 H.P. Speedway Motor.
Speed, 14 miles per hour.

Speedway CRUISER

An ideal motor yacht of moderate size, splendidly built and equipped. Equally well adapted for coastwise cruising and inland sailing. Comfortable accommodations with Owner's private stateroom, dining saloon and liveable crew's quarters. An exceptionally able and attractive appearing craft.

A New Model

"A motor proven to be remarkably efficient"
Our Model "M" Speedway motor is built in four, six and eight cylinder units. We are, therefore, prepared to meet the demands of those who desire additional speed.

Gas Engine & Power Company

and

Chas. L. Seabury & Company
Consolidated

MORRIS HEIGHTS

NEW YORK U.S.A.

Why Sterling motors are Berling-sparked

There are few harder tests of a magneto's dependability than its use on a marine motor.

And because the Sterling Engine Company has set such high standards for the power, speed and reliability of their motors, they demand a magneto which will be:

First: Waterproof.
Second: Possessed of a hot, fat spark.
Third: Absolutely dependable.

Their own official tests, plus years of actual experience, have proved that the Berling is the magneto which combines these essential qualities.

Ericsson Manufacturing Company
Buffalo, N. Y.

Berling Magneto

WORTH MORE DOES MORE

Here's the Motor for Weeds and Shallows

PERHAPS you're one of the thousands of boating lovers whose chief joy-killer through seasons past has been weeds. Maybe your favorite fishing or hunting "grounds" or that river you loved to explore has always been chuck full of weeds. You dipped them up at every stroke of the oar or you had to spend half your time hanging over the stern of the boat pulling them off the propellor. It just killed your fun. But now, with a

Liberty Drive ROWBOAT MOTOR

on the stern of your rowboat, your weed troubles are over. It goes through weeds like an eel. Takes you anywhere a boat will float. You can drive your boat right up on the beach. The propellor rises over stones, sunken logs or other obstructions. It's simple as A-B-C. Anyone can operate it.

Works Like a Big Launch Motor

It attaches to any rowboat by simply turning two thumbscrews. It operates on the same principle as motors in big launches. The shaft extends straight out from the rear of the boat. The engine is in a vertical position. The drive is direct from engine to propellor. The entire motor pivots on stern of boat. Can be raised or lowered by pressure on steering handle. Steers by swinging propellor to right or left. Has speed of 5 to 10 miles an hour. Weighs about 60 pounds. Guaranteed against defects in workmanship or material. Send for details. Get our beautiful Liberty Drive Book now. Have your motor in ample time. Also please name your dealer.

Price Only **$58.00**

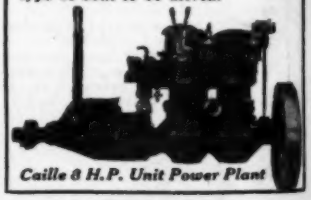
all complete ready to run, with battery ignition. May be demounted in two sections, for ease in carrying. Can be quickly connected together.

CAILLE 5 Speed Motor

for those wishing highly refined motor. Has 5 speeds, 2 forward, 2 backward and neutral. Has a starter; no cranking. Magneto in flywheel. Positively the highest development in rowboat motor design. Special Catalog on request.

For Larger Boats

We build a complete line of marine motors from 2 to 30 H.P. In writing for special inboard motor catalog always give length, beam, draft and type of boat to be driven.



Caille 8 H.P. Unit Power Plant

Dealers

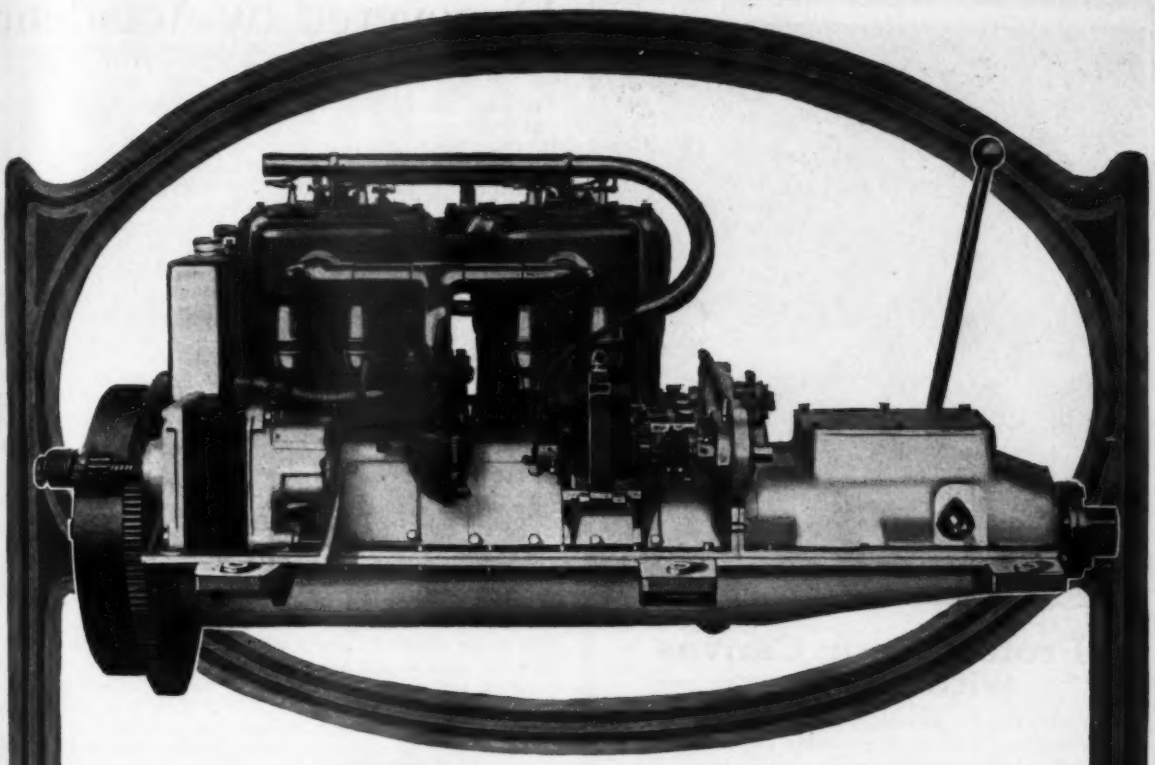
National advertising and low price is going to sell thousands of these motors. Many are going into your territory. Cash in on them. Send for dealer's proposition now.

CAILLE PERFECTION MOTOR COMPANY
43 Caille Building, Detroit, Mich.

CAILLE

On Marine Motors Is a Hallmark of Quality

Advertising Index will be found on page 100



Wisconsin

CONSISTENT

The New Liberty Type Motor

Through long years of peace the WISCONSIN has been marking up a remarkable record. This record was crowned when the Government experts selected the WISCONSIN as the official engine for four wheel drive and militor trucks as well as the 1½ ton Garford.

Flexibility, ease in starting, perfection in fuel and oil systems and, above all, extreme dependability and durability under the most exacting conditions formed the basis for this choice. Performance of 15,000 WISCONSIN Liberty Type Motors at the front furnished unassailable data for the Government's selection of its motor standard.

These facts, together with those collected from peace-time performance are now available for manufacturers who seek to build quality into their products despite comparatively slight increase in cost. A letter will bring them.

WISCONSIN MOTOR MANUFACTURING CO.

Station A, Dept. 302, **Milwaukee, Wis.**

New York Branch: 21 Park Row, T. M. Fenner, Factory Representative. Marine Equipment & Supply Co., 610 Arch St., Philadelphia, Pa. Pacific Coast Distributor: 1310 So. Los Angeles St., Los Angeles, Cal.

Discovered by Accident

(*Continued from page 27*)

Salts for the exhaust emitted copious quantities of soot that bobbed astern after the fashion of a paper bonfire disturbed by a draft of wind.

I therefore screwed a small sight feed cup into the branch of the T, leaving the after end open, filled the cup and adjusted it to four drops per minute, which I concluded to be about the right treatment. I experimented, and the motor took the water kindly along with the air that rushed through the T, not a drop escaping its guzzling thirst. I opened the feed wide and the resulting stream of water went into the motor, which gave no indication of nausea.

My device served two ends: Improved the explosive mixture and eliminated the tendency to puddle in the manifold. Also, the water fought carbon to a finish by softening the deposit through steam treatment, the jinx being thrown out by the exhaust. G. S. H., Boston, Mass.

A Pail of Water Once a Month

(*Continued from page 27*)

Where stalling is feared close the petcock and allow the motor to speed up again when the water can be turned on. The motor should be run at a good speed during this operation and kept as hot as possible.

About ten minutes are required to pass a gallon and a half through the motor and if this is done once a week you can feel that the carbon will cause you no trouble.

There will be absolutely no injurious results from this practice, the chemical action of which is fully covered in the January, 1919, issue of MOTOR BOATING, pages 25 and 26.

E. J. S., Springfield, Mass.

A Home-Made Device

(*Continued from page 26*)

In either installation the operation is the same. The tank is kept filled with water and the amount fed to the coil is controlled by the needle valve. Immediately on reaching the first section of the coil the small amount of water fed in is vaporized and while passing through the succeeding turns is superheated and dried, in which condition it most readily combines under heat with the other elements.

Should the tank run dry or the feed be shut off no harm will be done the coil. A few minutes before stopping the motor turn off the water feed and do not restore it until the motor has thoroughly warmed up. The proper amount of water to be admitted to the coil must be found by experiment, just as the carbureter setting is determined.

Advertising Index will be found on page 109

Discovered by Accident

(*Continued from page 27*)

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E. J. S., Springfield, Mass.

Graphic Navigation

(*Continued from page 58*)

33. TWELFTH STEP—Log. Sin. s—h.

In line with 22 under 33 degrees, take out the Log. 9.74036, and in near Diff. column take out 1 in line with 4 in seconds column. Add, since the Log. sines increase the greater the angle. Thus: $9.74036 + 1 = 9.74037$, which equals the Log. Sin. s — h.

34. THIRTEENTH STEP—To Multiply by Logarithms. Add the Logs. The Sum of These Logs. Will Be the Log. Hav. of t.

Log. Sec. Lat.	10.05511
Log. Cosec. p.	10.03149
Log. Cosin. s.	9.65202
Log. Sin. s — h.	9.74037
Log. Hav. t.	9.47899

In table 45 Bowditch find the value of the Log. Hav. of t. Searching the table, we find the Log. and over it in same column discover the Hours and Minutes, and in line with the Log. at the left of page find the seconds, namely, 4 hours 26 minutes and 20 seconds, which is the Hour Angle t, or Local Apparent Time. (L.A.T.).

35. FOURTEENTH STEP—Subtract L.A.T. from G.A.T.,—G.A.T. is Greater Longitude West.

G.A.T.	10^h	28^m	21^s
L.A.T.	4^h	26^m	20^s
λ	6^h	2^m	1^s
Converting to Arc.			15
Lo.	90°	30′	15″ West, Ans.

35. REMARKS.—Sights for Longitude should be taken when the Sun bears either as nearly east or as nearly west as possible, but the Sun should not be so low that the altitude will be affected by refraction seriously.

Problem in Meridian Altitude of the Sun.

On a ship becalmed in Long. 90°, 31′ west, a noon sight for Lat. was taken July 16, 1918. Obs. Alt. ☉ 84° 30′. Sun bearing south.

Chronometer slow 32 seconds.

Required the Lat. Ans. published in next article.

As we have seen, time equals Long., so Long. equals time.

ERRATA

In last paragraph, second column, 17th page of February issue, substitute Meridian for Zenith in the two places it occurs, and last line, fifth step, page 19. Altitude of Sun should be, (h).

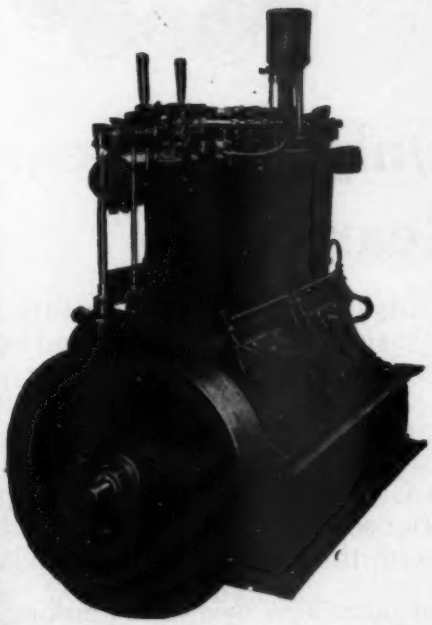
Advertising Index will be found on page 100

Advertising Index will be found on page 100

Don't be bothered with troublemakers

NO

CARBURETER
MAGNETO
BATTERIES
SPARK PLUG
IGNITOR
IGNITION POINTS
COILS
TIMERS
WIRES
SWITCHES
HOT BALL
HOT TUBE
HOT TORCH
FUEL PUMP



Quayle

Oil-Burning Marine Engines

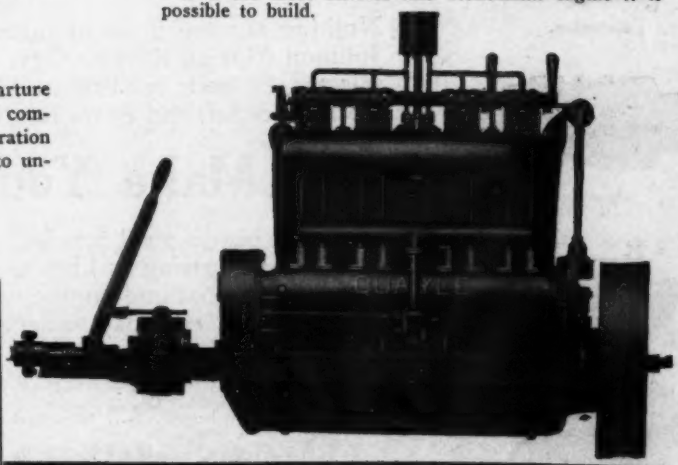
(Hvid Type)

Starts and runs on any oil that flows—burns all the fuel—no waste—saving in fuel alone pays for the engine in 300 working days. It starts as readily in zero weather as in summer. You get more power on cheaper fuel.

Particularly adapted to use on cruiser, powerboats, launches and the smaller commercial craft.

The Quayle is dependent on nothing but compression for its ignition. All troublesome ignition troubles and equipment are eliminated. It is the most simple engine made—it is the most durable and economical engine it is possible to build.

The "Quayle" is not a decided departure from the ordinary four-cycle internal combustion engine. Every part of its operation and construction is simple and easy to understand. Anyone can operate it.



WHAT IT IS

Your engine problem is solved in the Quayle. It is the type of engine that answers the demand for power—speed—durability and economy! Learn why. Send for our complete catalog—and simple explanation. Just furnish us your name and address. We will send the data **FREE**

COMMONWEALTH MOTORS CO.
326 W. Madison Street Chicago, U. S. A.

Advertising Index will be found on page 100

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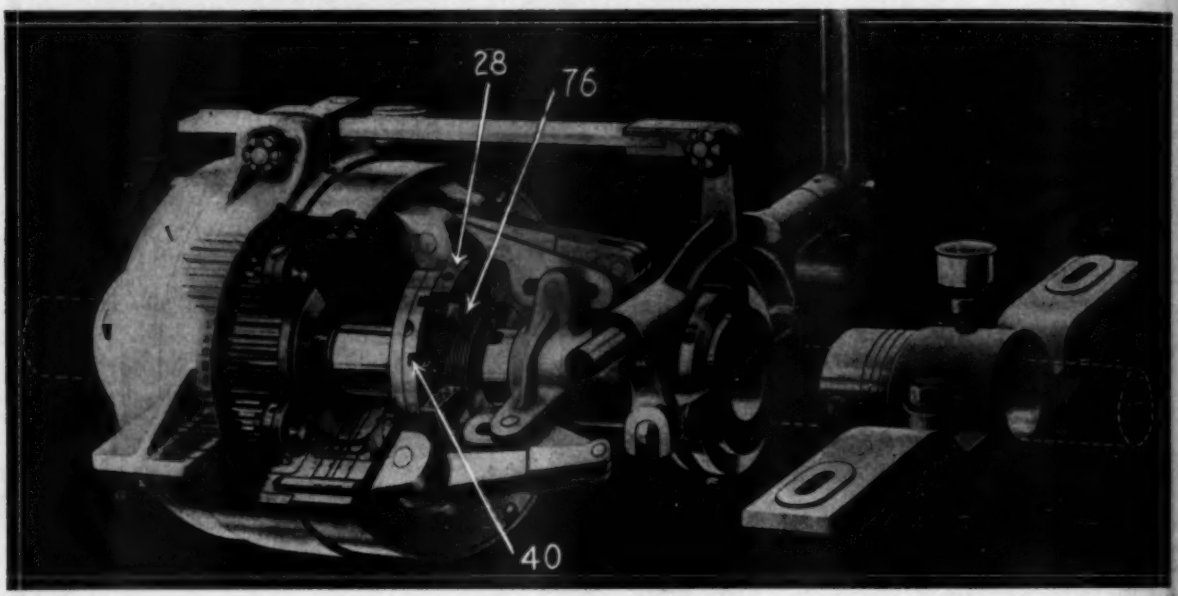
TAKE CARE OF YOUR PARAGON REVERSE GEARS



LIKE any other machine the "Paragon" gear requires a little intelligent care. If it is correctly installed, kept properly lubricated and carefully adjusted, it will give no trouble. The forward drive is obtained by means of the disc clutch, which locks to the case, causing the whole to revolve as a solid coupling. The locking or clamping of the discs is caused by the pressure produced by the leverage obtained through combination of operating lever and the expansion of the fingers. Unless the pressure on the discs is great enough the clutch will slip and heat and the discs, consequently, will cut up badly, which will destroy their carrying power. This will necessitate buying new parts.

If the clutch slips, back out the set screw (76) and turn the screw collar (28) to the right until the set screw (76) is opposite the next slot in the brass check collar (40). Then set up the screw (76) so that the end of it will come in the slot. Repeat this operation as many times as necessary until the clutch does not slip. Remember that every time the clutch slips the plates become thinner and further adjustment is necessary to take up the wear. It is therefore necessary that this adjustment should be obtained before the clutch is allowed to run at all.

The neutral position is obtained when the operating lever is vertical. The reverse position is obtained by means of the brake band, which clamps around the case and keeps it from revolving. The brake band is operated by throwing the lever back as far as possible. Should the outside case turn when the lever is in this position, remove the cotter pin from the bolt at the top of the brake band and turn the nut to the right until the case ceases to revolve, keeping the lever thrown back as far as possible. When this is obtained, replace the cotter pin.

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